The Builder.

VOL. LXII. No. 2375. SATURDAY, JUNE 11, 1892.

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The Restoration of the Choir of Peterborough Cathedral.

ON Thursday in last week, June 2, a special service of much stateliness was held in Peterborough Cathedral, in the presence of a very large congregation, for the dedication, by the Archbishop of Canterbury, of the costly furniture and adornments which have been added to the choir since its formal re-opening in October, 1890.

The character of these additions, from their costliness and elaborate workmanship, demands a special notice. The whole of them have been designed by Mr. Pearson, R.A., who has thus set the stamp of his architectural ability on the decoration of one of our noblest cathedrals, which his engineering skill had already saved from a threatened ruin. Much as has been already done for the substantial repair of the fabric in the taking down and rebuilding the central tower with its sustaining piers and arches, and in the under-pinning of the north aisle and transepts, at the cost of more than 31,000*l.*, the struts which still extend their unseemly bulk at various points of the fabric, especially at the north-east corner of the Eastern Chapel, indicate that this most essential work is by no means complete, and that a large expenditure will be still needed before the Cathedral can be said to be in a state of complete security. The west front especially, the chief glory of the edifice, causes much anxiety. The façade is leaning outward bodily, and the whole calls for speedy attention to forestall possible disaster of no ordinary seriousness. This careful survey, we understand, Mr. Pearson will commence as soon as he can be provided with the necessary scaffolding, which, as our readers do not require to be informed, "means money," and a good deal of it. May it be forthcoming. The eastern angle of the chapel beyond the apse or "new building," as it has been commonly called since it was first erected more than four centuries ago, the ceiling of which is one of the most admirably-designed examples of fan-tracery in the kingdom, evidently from the same hand as King's Chapel, Cambridge, has also given way, through the failure of the foundations, and requires underpinning and repair. When we add that the masonry of the gables of the transepts is in many places insecure and requires extensive repairs, and that the corner turrets of the central tower, which has now a painfully squat appearance reminding one of Winchester, still have to be built, it will be seen that the Dean and Chapter have much on their hands before the external works are finished. We have said nothing of the building of the south-western tower, which is so urgently needed to balance its sister to the north, and complete the harmony of the western prospect. For this long-desired work no very large sum would be required, and we have often hoped, and hope still, that one of our northern millionaires, when he catches sight of the unfinished design as he passes by on the railway, may be fired with the desire of immortalising himself by undertaking it.

But it is time that we pass from what remains to be done, to that which is the proper subject of this article, viz., what has been done by way of internal decoration.

Under this head we have to speak of the Bishop's throne, the choir pulpit, both presented by the present Dean, Dr. Argles, the choir pavement,—also the gift of the same munificent benefactor, who had previously given large amounts to the works of material restoration, and the cleaning of the stonework of the nave,—the choir stalls, presented by various donors, together with the litany desk and other minor matters.

The throne and pulpit are both placed, somewhat unusually, outside the ritual choir, —which has been brought back from the eastern limb to its ancient place in the first two bays of the nave,—against the south-east and north-east piers, respectively, of the great eastern lantern arch. This position was rendered almost necessary by the throwing open of the transepts,—as at Westminster Abbey and Norwich,—for congregational purposes. However advantageous this arrangement may be for the accommodation of hearers and worshippers, to throw the transepts into the choir without any intervening screens, is as injurious to the general effect of the building as it is contrary to the intentions of the original builders. Light iron grilles, similar to those which occupy a like position across the lesser transepts at Lincoln, would have satisfied the eye without materially interfering with sight or hearing. When so much still remains to be done, and the inflow of funds is naturally not so plentiful as in the first enthusiasm of the movement, we hardly like to suggest fresh expenditure; but there is hardly any work which would be more rewarding in general effect. Screens are even more urgently required for the arches on either side of the constructional choir, which, now that it is denuded of all furniture and fittings, looks painfully naked and open. Grooves in some of the huge Norman columns show where such screens once stood, and where it is to be hoped they will ere long stand again. Though we cannot profess to be admirers of Blore's woodwork which, however admirable in material and workmanship, shows a fatal want of recognition of the difference between wood and stone to work in, we should have been glad if, when Dean Monk's choir, dating from 1830 (the year, one may say, from which dates the first commencement of the movement for cathedral restoration), was dismantled, the fronts of his strangely-designed stalls had been used to screen off the aisles. They have been so employed on the north side of the nave to form choir and clergy vestries in the aisle, and that with an effectiveness which makes us the more regret their removal from the choir.

To turn from noting deficiencies to the description of the costly works dedicated last week. The first to challenge attention is the new throne, which, from its position, is conspicuous in the eastward view almost as soon as the cathedral is entered. This has been executed in oak by Mr. Thompson's workmen at the cost of 1,250*l.*, and, as we have said, has been the gift of the dean. "It was not every dean," the bishop remarked at the luncheon, "who wanted to build a throne for his bishop." Though the conventional type of an episcopal throne, as a choir stall of greater loftiness and richness, has been maintained, Mr. Pearson has given a

degree of originality to his design, by omitting the front legs of the canopy, which rests on curved supports coming forward from the back. The canopy is very lofty, ending in a tall, crocketed spirelet reaching halfway up the triforium, and comprises three tiers of rich tabernacle work, connected by delicate pierced fenestrations. The angles of the principal canopy are accentuated by square turrets of pierced work,—*lanterns* we may almost call them,—also ending in spirelets. The niches of the canopy contain statuettes of abbots and bishops of Peterborough. In the lower tier are Saxulf, the first abbot, Cuthbald his successor, De Seez the builder of the choir, Benedict the builder of the nave, St. Hugh of Lincoln (of which diocese Peterborough formed part till the Reformation changes), and lastly, John Chambers, the last abbot and first bishop. In the upper canopy are figures of Bishop Dove,—a favourite preacher with Queen Elizabeth, who called him "the Dove with silver wings,"—and of Bishop White Kennett, the eminent antiquary and historian.

Against the corresponding pier on the north is the pulpit. The body is of circular outline, ornamented with panelling and tabernacle work of somewhat excessive richness, and broken by projecting niches containing figures of the Apostles St. Paul, St. Peter, St. John, and St. James. Between these are wide panels, with carvings in high relief of Our Lord's parting Commission to His Apostles, the Day of Pentecost, and Saxulf Preaching to the Gyrvians. The pulpit rests on an elaborately-carved polygonal base, with niches containing statuettes of four of the Abbots connected with the building of the Cathedral. The figure-carving of the pulpit is by Mr. Hitch, who is responsible for the greater part of the carving at Truro Cathedral; that of the throne, we believe, was executed at Peterborough, under Mr. Thompson's superintendence, by his own workmen.

Passing westward, and entering the ritual choir, the whole range of stalls, nineteen in number, has been completed on the south side, filling the two bays of the arcade comprised within the limits of the choir. On the north side only seven stalls have as yet been erected, leaving twelve to be made up. There are also six return stalls at the west end, three on either side of the entrance. Eighteen of these stalls having been given since 1890, were included in the service of dedication. They exhibit semi-hexagonal canopies, with ogee, crocketed, and traceried gablets, flying buttresses and pinnacles rising into elaborately carved niches with ogee pediments containing statuettes, the design finishing in a lofty crocketed spirelet. The ornamentation of the lower canopies is rather crowded, and suffers from excess of richness. In common with the throne and the pulpit, the carved work is somewhat too profuse and "busy," and a quieter and bolder design would have been more effective. The wearied eye craves for repose. The two terminal stalls at the west end for the dean and vice-dean are loftier and more elaborate in treatment. They are three stages in height, with two tiers of statuettes, and have taller spires. The sides of the terminal stalls flanking the entrance bear panels carved with legends from the history of the abbey,—the wonder-working arm of St. Oswald, the apparition of the angel to Ethelwold, &c. The canopies of all the stalls are groined within, with bosses at the intersection of the ribs. The statues in the niches present a sculptural record of the history of the fabric in its successive representative personages, from Peada, the founder of the monastery, to Archbishop Magee and Deans Saunders and Perowne. Other statues illustrate the history of the Church of the O. T. and N. T., as represented by the Patriarchs and Prophets, the Apostles and Evangelists. The selection and arrangement is the result of careful study, and will repay examination. The fronts to the central range of stalls on each side are relics of the old Benedictine choir, now once more restored to their original place and use. The ogee panelling and traceried work, divided by small buttresses and crocketed pinnacles of remarkable beauty, has been made good from the traces left after the Puritans had brutally torn off the carved work, leaving the plain wood behind. The new stall-fronts have followed the same model: we wish their hue could have been adopted. The whole of the new woodwork looks painfully raw. But this is an evil that time will mend. We must not forget to mention a handsomely-carved Litany desk executed in oak, the gift of Mrs. Rigg, the daughter of the late Archdeacon Davys, which stands in the centre of the choir.

The most distinctive feature in the refitting of the choir is the sumptuous pavement of tessellated work and inlaid marbles, which as long as the Cathedral stands will perpetuate the name and record the munificence of Dean Argles and his daughter. This pavement has been designed by Mr. Pearson, and carved out by Italian workmen under the superintendence of Mr. Robert Davison, of London. The whole of the marbles employed are from Italian quarries, of rich and varied hues, contrasting and yet harmonising. The cost has been little, if at all, short of £2,000, the original estimate, we need hardly say, having been largely exceeded. The pavement is divided into sections, increasing in richness of material and complexity of design as it advances eastward. The ritual choir and the lantern space are paved with tesseræ of a subdued red, green, and white, arranged in a geometrical pattern, the low tone satisfying the eye without distracting it. The floor of the eastern limb is divided into three chief sections corresponding to three bays of the arcade, the sanctuary and altar-space forming a fourth section in which the decoration culminates. The bays are separated by steps of polished marble of various kinds, the first step being of the black Frosterly marble flecked with white madrepores, familiar to us in the Chapel of the Nine Altars at Durham; the two next are of Levanto marble of a reddish-brown with white veinings. The remaining steps, as well as those of the footpace of the altar, are of pure Pavonazzo with exquisite veinings. The design of the pavement of the first two bays is the same. Four large parallelograms of Pavonazzo are set in a framework of deep red porphyry, the intervening cruciform space being occupied by interlacing bands of cream-coloured tesseræ forming circles and lozenges on a tesselated ground of red and black. The third bay, though of much more elaborate design, is hardly so effective. The design comprises three square compartments laid transversely from north to south, each containing four panels of Cipollino, framed in bands of "opus Alexandrinum," made up of squares, triangles, and diamonds, of brilliantly-coloured marbles, which are again set in a broad border of mosaic of white squares on a light green ground. The design of this bay strikes us as too much scattered and somewhat deficient in decision of outline. Bolder lines would have been more effective. The fourth bay shows a system of interlacing bands, enclosing alternately large and small octagonal spaces, the small octagons being filled with rich plaques of marble, the larger being divided into eight triangular panels of marble mosaic of varied patterns. At either extremity of this bay is a long panel of intersecting circles, filled with rich mosaic. The altar footpace, and the three steps, are as yet unfinished. They are to be inlaid with rich mosaic enclosed in marble bands. The pavement north and south of the altar is of "opus sectile," exhibiting hexagons of Pavonazzo, between lozenges of a rich marble resembling our English serpentines. The entire design is finished on the outside with a long band of red marble extending the whole length of the Presbytery. Though, as we have said, the pavement might have proved more effective if greater simplicity and boldness of outline had been adopted in some parts, it must be acknowledged to be a magnificent work, which calls forth admiration both for the elaborateness of the design and the richness and beauty of the materials employed.

The reredos, side screens, altar rails, and credence-table are still deficient, and wait the liberality of future donors. The place of the two first-named is temporarily supplied by rich hangings. Behind and over the altar is a tester of crimson and orange velvet, plain but effective. On either side are curtains of a dull green, entirely excluding the view of the apse and of the chapel beyond, which is to be regretted.

Among the *desiderata* enumerated is the reconstruction of the organ. We observe that it is proposed to place it in the triforium, as at Canterbury. This may be necessary, but it is much to be regretted. An organ enclosed in a case, such as men were once able to design and might design again, is a grand and beautiful object, and when placed, as we hold it ought always to be placed, on architectural as well as musical grounds, on the centre of the choir screen, it is of inestimable value as breaking the protracted vista, suggesting something beyond, and creating "that mystery of things half seen," which, as the late Mr. Street has truly said, "is the secret of many of the greatest successes of mediæval architecture." When the funds allow the Chapter to undertake the choir screen, which is one of the first wants of the Cathedral, to hide the plain and ugly backing of the screen stalls, we hope that no foolish outcry for an unbroken view from end to end, which our Cathedrals never had nor were intended to have, will prevent their putting the organ in its proper place, over the entrance to the choir, provided it is in any way practically possible from the organ-builder's point of view. The difficulty of course arises from the increased size of modern organs, especially in the department of the pedal, which includes the largest pipes in the instrument. But we think it may be possible, if the difficulty is fairly faced; and it would be better to reduce the contemplated size of the organ to some extent in order to get it into this position, as it is unquestionable that a rather smaller organ in the central position is more effective than a larger one placed in the triforium, while the architectural effect of the organ in the triforium position is of course entirely non-existent.

NOTES.

TWO very important resolutions are to be brought forward at the meeting of the Institute on Monday night, by Mr. Charles Barry and Mr. Searles-Wood, both having for their object to provide that within a limited period it shall be declared that every candidate for Fellowship of the Institute shall be an Associate, or shall have passed an examination qualifying him for Associateship, "except in such special cases of age, merit, or distinction as shall justify the Council in dispensing with such examination under Section 3 of the Charter." The reason for the movement is that at present men just past the prescribed age of thirty may be qualified to be elected as Fellows, and that it is an anomaly that a man who before that age would have had to enter the Institute through the medium of the examination for Associateship should, by merely waiting till he is thirty, be able to evade that test and enter as a Fellow. The Council have received various memorials in recommendation of this policy. That the present condition of things is an anomaly there can be no doubt; but the proposal is practically very much the same as a proposal for the examination of candidates for Fellowship, though it is perhaps a better way to put it. The proposal has a great deal of support, we believe, from provincial members especially.

MISS OCTAVIA HILL, in a letter to the *Times* of Tuesday, makes an eloquent but we fear fruitless appeal against the passing of the Manchester and Sheffield

Railway Bill by the House of Lords. After noticing that Parliament is asked to sanction the sudden and irrevocable destruction of a residential district of comparative quiet, against the strong representations of the London County Council, "the only body which can judge of London as a whole," Miss Hill continues:—

"This railway proposes to destroy two squares; to invade acres of space covered with cheap, pleasant houses with gardens; if constructed it would in a great measure cut off the whole poor district of Lisson-grove from its natural playground, —Regent's Park,—which at present is approached by pleasant wide streets with little traffic, safe for small groups of children to traverse alone, wide breathing spaces, now bright with laburnum and lilac hanging over the low garden walls.

I believe the line to have been thus planned with the sole view of its being cheap to the promoters.

It has been said that these leases will fall in in about fifteen years, and that the public has no security that when they fall in the ground may not be more thickly covered. That is no doubt true, but that is no reason why fifteen years of healthy life with gardens and good air should be snatched away by Parliament,—years which will distinctly influence the life of many a child now three or five years old."

There could hardly be a more forcible and touching plea put in against this last attempt to destroy the comparative quiet and repose of a whole district of London. As we have said, we fear the appeal is hopeless now. Years hence, when London has all been turned into one racketting-ground of noise and traffic and piled-up buildings, people may begin to find out, when it is too late, that there are more vital interests to the comfort of life than rapid locomotion, and that in search of that convenience London has been made all but unbearable as a place of residence either for poor or rich.

THE inquest on the death of the two men who were killed in the extraordinary railway collision at Birmingham has resulted in a verdict of manslaughter against the driver of the Midland train, and no other verdict seems possible on the evidence. The length of time (nearly an hour) which the jury occupied in arriving at this verdict was probably owing to a natural reluctance to bear hardly on a driver who appears to have a good record of long service with his Company; but as the evidence leaves no doubt that the signals were open for the London and North-Western train, and as it was proved that they were (of course) so constructed that they could not be open for both lines, there is no room for doubt that the Midland driver was going against his signals. According to the evidence of Mr. Loveday, the chief inspector of traffic for the Midland Railway, there are "confusing elements" in respect to the signals near the junction, which appear to alter their position owing to the curve and the interposition of a chimney. In that case some responsibility, not very easily to be defined, would seem to be placed on the company. The more serious matter is that, as far as the signalman at Duddeston Mill-road box could judge, the Midland driver paid no attention to his "caution" signal; and that he did not act as if he had seen it is obvious from the remainder of the evidence. It remains to be seen whether this was actually a case of culpable carelessness, or whether it is one of those instances which will occur at times, in railway traffic as in other matters, when the human machine unaccountably fails for a moment; when the eye sees what it expects to see, or does not see what it does not expect. Such momentary fallacies do happen from time to time, even to very careful and methodical men; whether this was one of them it is difficult to say; the trial may throw more light on it.

IT is clear that Mr. Goschen's change in the incidence of the patent duties has not in the least satisfied those persons who are interested in this subject. We have recently received a circular from a Patent Law Reform Association, which appears to be composed chiefly of Lancashire men. The subject cannot adequately be dealt with in a very short space, but the fact is clear that the question has now reached the point whether any but nominal patent duties are to be any longer in existence. The duty of about 7*l.* in the United States must be regarded as merely nominal. It may be that the increase of patents under a nominal duty would compensate the Exchequer for the loss in actual amount on each patent. It is questionable whether a patentee, more than an author, should be taxed for the purposes of revenue; but, be that as it may, it is well that we should not hide from ourselves that the time has now come when the point above stated has been arrived at. The issue between moderate and nominal duties will obviously have to be decided early in the life of the next Parliament.

IT is noticeable that in the recent Report of the Select Committee on Theatres there is no suggestion of the advisability of any general regulations to promote the safety of theatres, applicable to the whole kingdom, which would surely be desirable, instead of leaving each municipality to formulate its own regulations according to its own perceptions. It may be added that in addition to fire-resisting construction and good planning for exits, it would very much increase the confidence of audiences if the rule were followed which has been established in Berlin and some other continental cities, of compelling the management to keep on the premises a "fire-watch" composed of men who are retired firemen, familiar with the best methods of guarding against fire or combating it if it arises. The few recently-built theatres in London are as safe in regard to structure and planning as such buildings can be made, but the existing majority are only as safe as they can be made without entire rebuilding; and the knowledge that there was always, by legal regulation, a sufficient number of competent and experienced firemen on the premises would tend to give audiences that feeling of security that the building would be properly looked after, in the event of any accident, which does more than anything else to check panic.

BROCKWELL-PARK, Herne-hill, was formally opened on Monday morning last, amidst the rejoicings of the neighbourhood, by Lord Rosebery, Chairman of the London County Council, who commended the action taken by that and other bodies in saving this important "lung" to the neighbourhood, which is fast being covered with bricks and mortar. In addition to the new colony of houses which has sprung up at the top of Milkwood-road, opposite Herne-hill station, we notice that on Herne-hill itself, between the church and Poplar-walk, four new roads have already been marked out, so that this hitherto semi-rural neighbourhood will soon be materially changed, and there is likely to be ample need for the park as a breathing-space in the near future. Hardly had Lord Rosebery left the park when an event occurred which cast a gloom over the remainder of the day. Mr. T. L. Bristowe, M.P. for the Norwood Division of the Borough of Lambeth, in the midst of whose constituency the park is situated, and who had taken a prominent and active part in its acquisition, was suddenly taken ill, and died in the park after the lapse of a few moments. Mr. Bristowe's death at the very moment of the full fruition of his efforts in an important work has elicited widespread feelings of regret amongst men of all parties in his constituency.

THE threatened demolition of Emanuel Hospital, Westminster, is much to be regretted on more grounds than one. Not only is it a very interesting and picturesque old building, a peculiarly favourable specimen of its date, but the ground in connexion with it keeps an open space where open space is much wanted. The region neighbouring on Victoria-street is rapidly becoming a collection of enormous heaps of building, the height of which is quite out of proportion to the ground they cover; and it is on that account all the more desirable that any unbuilt space in the vicinity should be preserved intact. We are glad to see, therefore, from a letter in the *Times* of Thursday, from Messrs. Horne & Birkett, the solicitors representing some of those who are opposed to the removal of the building, that an application has been made to Mr. Justice Chitty on behalf of the Dean of Westminster and others for leave to appear and submit arguments why the building should not be demolished, and that this application has been assented to. It is to be hoped that the result will be the preservation of the hospital and its grounds as now existing.

THE great controversy between the Prussian Royal Academy and the "Verein Berliner Künstler" as to the management of the Berlin Art Exhibitions has been settled by compromise, neither body receiving the Government permission necessary for independent action. The "Verein Berliner Künstler" and the Prussian Academy will henceforward mutually arrange all the official art exhibitions which are held, each body being equally represented in the management. The Government reserves the right of revising the "programme" of the exhibitions, and also of deputing a representative to watch the proceedings of the joint committees. The "Verein" will, to a certain extent, incur the pecuniary risk of future exhibitions; they are to be managed with the capital of this society, which will have the benefit of any profits, but also the responsibility for deficits. The Government support consists of a loan of the halls of the Landes-Ausstellungs-Palast free of charge, and the vote of a substantial sum for purchases. A committee of connoisseurs (selected by the Minister of Education, &c.) will act as advisor to the Government as regards the purchase of exhibits, and the Emperor is to be requested to act as patron. The art exhibitions are henceforward to be of more national interest than the usually purely local ones held under auspices of the Academy. At certain intervals large international exhibitions, similar to last year's, will be arranged. It is to be hoped that under the new rule more attention will be paid to architecture, which has hitherto been very badly provided for in German art exhibitions.

WE note with pleasure that the German Emperor has selected Sir John Everett Millais to be a holder of the Order "Pour le Mérite" (Arts and Science Division, Foreign Section). It is the highest Prussian distinction, and is only given with the consent of the Knights of the most honourable order.

A DISCOVERY of very great interest has been made at Silchester, Hants, during the excavations that have been going on, on the site of the Roman city. This is the complete ground-plan of an Early Christian basilica of small dimensions, situated near the south-east corner of the Forum. As the earliest example of a Christian place of worship in the British Isles its value is great, and lends additional interest to the discoveries that are being made at Silchester. We hope to give a ground-plan and some more particulars next week.

THE new market for fruit, vegetables, and flowers, which is to be opened on the 13th inst., in West Smithfield, completes the tale of central markets erected by the Corporation, under statute. It will supplant Farringdon Market, and takes the place of one that was built, for the same goods, in Farringdon-road, opposite, but which, before its completion, the Corporation decided to open for the sale of fish, and which was so opened in May, 1883, having cost altogether 450,000*l.* As the fish traffic resulted in a heavy loss,

the building was converted, by Mr. A. Peebles, the then City architect, and at a further cost of 12,000*l.*, for the sale of poultry and provisions. Of the works for a new fruit market, as planned and designed by Mr. Peebles, we gave descriptions in our columns on September 13 and November 1, 1890. Messrs. Rudd & Son, of Grantham, took the contract, at 41,973*l.* for the basement and sub-structure. The super-structure was estimated to cost 15,500*l.* On February 28, 1885, we adverted to the establishment by the London Riverside Fishmarket Company of a fish market at Shadwell.

IT is stated that St. Mary's Hospital, Paddington, is to be added to, at an estimated cost of 100,000*l.*, as a memorial to the late Duke of Clarence. The present hospital, enlarged a few years ago, was built in 1845-9, of red brick with stone dressings, after the designs of Mr. J. H. Wyatt and Mr. Thomas Hopper; according to Cassell's "Old and New London:" in William Robins's "Paddington, Past and Present" (its preface dated in 1853), we read that Mr. Hopper was the architect, and made no charges for his professional labour. The entire plans were for five separate divisions, or blocks, with a total capacity of 380 beds.

A NEW form of cowl for chimneys and other minor ventilation, has been patented by Messrs. Wheeler & Sons, for which considerable merits are claimed, and which may fairly be classed as a good specimen of revolving cowls on the archimedean screw principle. The chief features of the cowl are the use of twin blades to the screw, the introduction of coned louvres within the wind-blades to prevent the admission of rain and snow, and careful provision for decreasing the friction of working parts, which is always the weak point of revolving cowls. The use of phosphor bronze for bearing surfaces, and the reduction of bearing points to one by careful balance of the cowl, tend to the reduction of friction.

THE vitality of some of the popular errors about the history and development of architecture is extraordinary. The notion that Gothic vaulting arose from an imitation of trees has been exposed and laughed at by every competent architectural critic for years back, and it is needless to say here that it is an idea which no one could entertain who had given the slightest intelligent study to the history of the development of Gothic vaulting. Yet in a critical article in the *Times* of the 6th inst. on the life and works of Gustave Doré,—an article, moreover, which as far as its notice of Doré's work goes is marked by a very sound spirit of criticism,—we are told, in reference to Doré's appreciation of Gothic architecture, "that he loved to go wandering in the forest solitudes of the Vosges, under those colonnades of stately stems with their arching foliage which had furnished the Gothic architects with their designs" (!) When are we to be rid of this nonsense? The writer of the article in question is evidently a man of education and thought in regard to some forms of art; let him, before he next refers to architecture in print, read any illustrated sketch of the development of Mediæval vaulting, by a competent exponent of architectural history, and he will then perhaps realise that architecture is not a subject to be dragged in for literary illustration without some knowledge of the scientific facts of its history and development.

THE development of new proposals for plundering the architectural profession under the name of "competition," has been going on fast of late years. It is always of interest to note a new feature. The last we hear of has been furnished to us in the form of the conditions for a limited competition to which some eminent Dublin architects have been invited. We suppress all names, as it has not been publicly advertised; but after giving the particulars for the building the instructions proceed;—

"It is to be understood that no fees or commission are to be payable to any architect who may send in plans as above, and that the building committee do not bind themselves to adopt any of the plans that may be submitted."

This really deserves the distinction of being the best joke of the kind that has yet been made; it is difficult to decide whether it is the offspring of pure audacity or pure innocence; or is it a characteristic development of Irish humour?

ARCHITECTURE AT THE ROYAL ACADEMY.—VII.

1,788; "New Tower, St. Mary's Church, Lynton;" Mr. H. Wilson. A water-colour drawing of a very original church tower, showing how its author has been trained in the school of the late J. D. Sedding, whose work he seems to be carrying on in the same artistic spirit. The tower is nearly plain up to the belfry stage, where coupled traceried windows are inserted, with a statue over the dividing mullion; a low-pitched leaded roof of concave outline projects its eaves boldly, and the buttresses stop flat under them; the wrought-iron gargoyles at the angles look a little thin and out of keeping with the solidity of the rest. The angle staircase turret appears to penetrate the roof and finishes in a small lantern a little too suggestive of a pigeon-house; but the whole is picturesque and original.

1,789; "East Window, Skelton-in-Cleveland Church, Yorkshire;" Messrs. Shrigley & Hunt. A five-light window with a figure of Christ in the centre light on a rather larger scale than the figures of saints in the other lights, which we think a mistake; the general colour-effect of the window is very good, and the architectural canopies are treated with due subordination and mass well with the whole; but here again we have canopies which project in perspective and leave platforms in perspective for the figures to stand on, which is contrary to the true principle of stained glass; and having this appearance of bulk, there seems nothing adequate to support them.

1,791; "Figures from the Workmen's Window, Law Courts, Birmingham;" Mr. P. H. Newman. We published these figures in the *Builder* for July 25, 1891, with the decorative adjuncts to one figure only. The effect of the whole is very rich, and interesting as an unusual introduction of Renaissance architectural detail in stained glass; but the effect of the heavily-coloured perspective niches is here again very solid for a surface intended to transmit light, and the boots, aprons, braces, and other details of working-men's costume have an odd effect in stained glass. If it were determined to treat the figures as realistic types of working-men this could not be avoided, and the conundrum has been solved perhaps as well as it could be under these circumstances; but we should have preferred emblematic to realistic figures for a window. These would have been quite suitable for wall painting; a window is another affair entirely.

1,793; "'In Heaven their Angels Always Behold the Face of My Father': Design for a Stained-glass Window for Rydal Church;" Mr. Henry Holiday. This is a true example of decorative stained-glass, entirely clear of realism or perspective; the design is made up of winged children's figures (the purple wings furnishing a valuable element in the colour design), bearing scrolls with texts, the figures and scrolls intertwined with foliage, with a sky background. This is an unusual and very fine and successful piece of stained-glass design.

1,794; "Portion of the East Window of Bath Abbey;" Miss Emma Knight. A very fine and powerful illustration of old stained glass, giving almost the rich effect of the glass itself, at least to an extent seldom produced by pigments.

1,797; "Design for a Window at All Souls' College, Oxford;" Messrs. James Powell & Sons. A Renaissance window in small square leadings, of which the border is an admirable piece of ornamental design; in the centre is an architectural niche with a figure of Wren in his habit as he lived, with a panel with arms and supporters below the niche. The mistake of this is that this architectural erection seems to be hung in air in the middle of a white space, and has nothing to support it, nor is the figure in blue coat and buckled shoes happy in effect. A medallion portrait with a less architectural framing would have been better for a window.

1,798; "The Baptistery, Florence; Zodiac Panel in Pavement;" Mr. R. W. Schultz. A very careful pencil-drawing, slightly tinted in places, showing the pavement on plan, with the joints of the main slabs carefully marked. This affords an admirable study for real decorative work in pavement inlay; the artist has attempted no more in his representation of the signs of the Zodiac than is quite within the powers of inlaid work; and though the design is generally symmetrical, there is an entire absence of that minute care for symmetry which would tend to give the design a mechanical hardness.

1,800; "Design for a large Town House;" Mr. Arthur Bartlett. A very pretty and original design, shown in a tinted pencil-drawing; it is not easy to see, however, what can be the function of the little windows between niches and colonettes which form the only openings in the mass of wall on the ground floor. Architecturally the effect is charming, but how does it fall into the plan, and what becomes of any entertaining room on the ground floor? A plan might have solved the riddle, but none is given. The upper portion shows a recessed centre with mullioned bay windows running through two stories and stopped by the soffit of a balcony connecting the end wings. The lanterns over the wings are the least happy features, and seem out of place and unmeaning.

1,802; "Glasgow Art Gallery, Competitive Design;" Mr. A. N. Prentice. A curious but very picturesque design of somewhat Spanish character. The centre feature is a circular tower with a conical roof and lantern, rising from a square central block, and flanked by circular turrets which sit on the angles of the square. The rest of the building is a long nave extending both ways, with a transept terminating in an apse abutting against it. The ground story is kept quite plain, only broken by entrance-doors, the upper story richly treated with rows of small circular-headed windows very deeply recessed, and the eaves projecting in an immense cove over. The transept is kept quite plain, affording a base for the ornate treatment right and left of it. The author seems to have been strongly influenced by his sketching tour in Spain, and the whole look of the building is as if designed for a hot country (the presumable roof-lighting is kept out of sight behind a balustrade on the roof); one certainly could not fancy it in Glasgow; but it is a brilliant architectural conception nevertheless.

1,803; "River Nook, Wraysbury;" Mr. T. E. Collcutt. This is published among the plates in our present number, to which we refer the reader. By Mr. Collcutt's courtesy we are enabled also to give the plan of the house, which is not shown on the drawing at the Academy.

1,804; "Drawing-room Ceiling, Ashridge;" Mr. T. Strethill Smith. It is impossible to deny boldness and vigour to this ceiling design, but that is all it can claim. It has all the worst and most rampant vulgarities of Louis Quinze taste; immense cartouches with the usual gilt shoulder-knot kind of feature dear to the period; bundles of instruments and other things sticking out from the margin, heavy garlands festooned horizontally, &c. The centre portion is occupied by a copy of Guido Reni's "Aurora," a composition quite out of place on a ceiling, and the ragged outline of the frame which surrounds it has a very bad effect. The author has reproduced faithfully and with spirit the characteristics of one of the worst periods of decorative taste.

1,805; "Convalescent Home, Chatham," and 1,806, "House at Royston, Herts;" in one frame, by Mr. John Belcher, may be taken along with 1,813, "Studio, Melbury-road;" and 1,814; "Mark Ash, Abinger," also in one frame, and by the same architect: four small water-colours of characteristic and pretty little buildings. In 1,813 and 1,814 the figures are evidently wrongly placed or wrong in the catalogue; 1,814 is the studio; it is to the architect's credit that it is quite obviously so, even without any plan. "Mark Ash" is an exceedingly pretty specimen of a small country house treated in "picturesque cottage" style.

1,808; "Flixton Hall, Suffolk;" Mr. F. B. Wade. This is apparently an addition to a rich old Elizabethan house: a plan is given showing the extent of new and old work. The additions

consist of a large conservatory forming the main garden entrance, new garden fronts to the drawing-room and morning-room, and a very extensive return wing of lower buildings in the same ornate style, containing kitchen and other offices, and another conservatory towards the garden court. The house is in the richest Elizabethan style, of brick with stone dressings, panelled balustrades, cut brick chimneys and pinnacles, but as all the work shown in the perspective view is new, we cannot tell how far this is a carrying on of the design of the original, or how far it is a creation of a modern Elizabethan house. If the latter, it is very completely done and in a very rich and pleasing style, though it cannot be said to present any originality of idea or detail. The octagon turret above the garden entrance is a very pleasing and picturesque feature. The drawing, a large water-colour in the true "architectural draughtsman" style, is weakly executed and not good enough to do full justice to the building.

1,811; Caer-hun, North Wales;" Mr. T. M. Lockwood. A good sepia drawing of an exceedingly solid stone house with mullioned windows, this portion contrasted with the half-timber work of the secondary portions of the house, which seem to shelter behind the solid mass of the other portion. If, however, this is a new house all built at the same time, it has too much the appearance of two different buildings of different dates. There is no plan to give any explanation on this head.

1,812; "St. Bartholomew the Great, E.C., the New Transepts;" Mr. Aston Webb. Three fine solidly-executed line drawings in one frame, showing the interiors of the two transepts and an exterior view of the north transept and porch. In the north transept the triforium arcade is carried round, with three lancet windows over, which show cusped heads externally, but internally are masked by arches with traceried heads divided into two lights by (apparently) Purbeck or other marble shafts, which are shaded darker in the drawing. In the south transept the triforium arcade is stopped, and the end wall above the main arcade occupied by three large two-light windows with geometrical tracery in the heads. The drawings are by Mr. C. E. Mallows.

1,815; "Gloucester Cathedral, Interior of Choir;" Mr. C. E. Mallows. This is the drawing published in the *Builder* of Dec. 5, 1891, as one of the illustrations of Gloucester Cathedral.

1,816; "Design for a Window, Trinity College, Oxford;" Messrs. Jas. Powell & Sons. This is another example of a Renaissance architectural shrine with a figure hung in the middle of white squared glazing; but it is less open to objection than No. 1,797, because the architectural framing of the figure is treated in a more light and decorative manner and with less of architectural formality and squareness. Still, even here, the niche is too much as if hung in air. Apart from this objection, the design is graceful and effective in its dealing with decorative details which have the sanction of precedent, though they are anything but pure in taste.

THE APPLICATION OF METALS TO ARCHITECTURAL DESIGN:

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following is an abstract of Mr. Alexander Graham's "Historical Sketch of the Application of Metals to Architectural Design," read at the meeting of the Institute on the 30th ult., as an introduction to the three papers* read by Messrs. C. Krall, H. Longden, and H. W. Singer on "Castings in Metal":—

The application of metals to the adornment of buildings might be traced to a very remote period of the world's history. The exact period when the work of the hammer and chisel was supplemented by acquaintance with the earthen mould was not recorded, but tradition attributed this distinction to Phrygia. The art was, however, probably known to the Israelites in the time of Moses. The beating of copper must have been familiar to the earliest races, and the leathern shield with its studs of glittering copper was probably the earliest piece of decoration applied to buildings. The earlier founders made their castings as thin as possible, and attached them to a wood foundation with pins of metal; and this would account for the scarcity of ancient examples, whether in copper or in bronze. It was doubtful whether the Phrygians made any progress with their invention, but it spread with rapidity in other countries. The walls of Babylon were defended by a hundred gates of bronze, and metal was extensively used both for the construction and adornment of buildings in Chaldæa and Assyria. The gates of Balawat, composed of plates of beaten bronze, made for Shalmaneser II., about 850 B.C., were now to be seen in the British Museum. Philostratus said that the palaces of the kings of Babylon were "covered with bronze which caused them to glitter in the sunshine." The use of metals applied to buildings in Persia appeared to have been restricted to covering their brick and timber construction with thin plates, sometimes adorned with work in *repoussé* and inlays of gold. At the present day the gates of the Mosque at Ispahan were covered with laminæ of silver, adorned with inscriptions and arabesques in gold. The forging of metals for decorative purposes preceded the casting in moulds. We had to turn to the Egyptians for the earliest artistic representations of the human form. They first used pure copper, being ignorant of the fact that by the admixture of a little tin its hardness could be increased. Among the metals in common use among the Egyptians was *asimu*, or electrum. There was a dearth of skilled workers in Judæa, and we learn from the book of Samuel that "there was no smith found throughout the land of Israel"; and this was probably the cause of their defeat by the better armed Philistines. The Phœnicians, who had at their command the commerce of the then known world, were able to place at the disposal of Solomon those who were the most skilled in metal-work, and amongst them Hiram of Tyre. The resources of the men who cast and chased and worked those masses of brass and silver, and even of gold, for Solomon, must have been equal to our own, though the methods might have been different. The date of this manufacture was a century before the birth of Homer, and a century and a half before the building of Carthage by Dido. Among the Greeks the application of the metals to decorative purposes was restricted. Copper and bronze and the precious metals were mere playthings in the hands of the Roman, and the traditions as to metal-work that had been maintained in Assyria and Egypt had been strengthened in his hands by an increased love of art and by the natural aspirations of a wealthy community. During the long period of the so-called Byzantine and Romanesque styles the same methods prevailed; there was an extension of art knowledge, but an absence of invention or originality. The most beautiful works at this period had their origin in strong religious sentiment, but they belonged rather to the arts of the jeweller and the goldsmith than to those pertaining to structural adornment. In France the bronze gates of the Church of Saint-Denis showed that the art of casting was familiar in that country as early as the twelfth century. The names of the artists in metal formed the history of metal-work during the most stirring centuries of the Christian era; and most of these masters in art were architects at that happy period of the world's history in which architecture was regarded as the art *par excellence*, to which all others were kept subordinate. At the Reformation the dry bones of art refused to be reanimated into life; the English Revolution effected nothing worth recording for the goldsmith or metal-worker; and the Restoration brought with it but few works of art, except perhaps the statue of James II. in Whitehall-gardens. The Gothic revival gave little more than a few improved patterns of gas-standards and altar-rails, but it enriched our literature with many valuable works on every known branch of metal-work. To architects the interest of metal castings was in their use in the adornment of buildings; and lessons from past history were of little practical value unless turned to account for the benefit and delight of mankind.

In the discussion which followed the reading of this and the three other papers mentioned,

Mr. J. M. Brydon, in moving a vote of thanks to the readers of the four papers, said that Mr. Graham's interesting introductory historical sketch had invested the subject with a sort of literary halo. Mr. Krall, with his intimate knowledge of the precious metals, had told them of many processes, but the substance of his remarks seemed to be that there was very little casting resorted to in the treatment of the precious metals, although there were occasions when cast-work was employed; but even when cast-work was employed, the artists very skilfully adapted the means to the end, so that when the work was produced it was very difficult to distinguish the wrought-work from the cast. Mr. Longden, as a practical ironfounder, had very ably and very lucidly described to them the *technique* of casting in iron. There were several gentlemen in that room who were not so very old as not to be able to remember that in the years following the Gothic revival it was considered to be quite the correct thing to scoff at anything cast, and to shrug one's shoulders at everything except wrought-iron; but we heard of the greatest artists in the world working in cast metal-work. Mr. Longden had, however, omitted to mention Alfred Stevens's magnificent castings. Mr. Singer had discoursed of practical bronze casting, and had explained the difference between sand castings and the wax process. It seemed to him (the speaker) that the great difference between the one and the other was that the wax process gave much more intimately the touch of the sculptor himself than the sand process did.

Mr. Onslow Ford, A.R.A., said the real difference between sand casting and the wax process, from the sculptor's point of view, was that the bronze produced by the sand process was five times removed from the original model, whereas the wax casting was only twice removed from it; and those two removes were so slight that a casting, when perfect, had the appearance, even to the artist who made the model, of being an exact reproduction of his design in bronze. Mr. Singer, in his paper, had said he hoped that we should be able in time to produce castings as good as those which were produced in the fifteenth century; but he (the speaker) should like to say that Mr. Singer had produced castings as fine as any that had ever been done in any period of the world's history.

Mr. George Simonds said that Mr. Singer had spoken of the sculptors of the Renaissance, Cellini and others, adopting the extremely laborious and risky process of first modelling the core and then making their wax over that, afterwards covering it with a mould, and firing and casting it, so that if anything went wrong the work would be lost, and the whole thing would have to be recommenced. But although they worked thus on many occasions, they were perfectly well acquainted with the process of making the piece-mould, and they had the replica of the original work to fall back upon in case anything should go wrong. Cellini himself gave a long description of both processes. Mr. Singer had referred to casting work by the two processes combined. That was a very important thing, and, as far as he (the speaker) knew, Mr. Singer was the first who had done it. It seemed an obvious thing to do when making a large statue for outdoor purposes,—or, indeed, for indoor purposes,—because in such cases it was obviously a fearful waste of time and expense to use the *cire perdue* process throughout. In the statues that were put up all over England it was not worth while to cast a man's coat by the *cire perdue* process, but it was worth while to cast his head and hands by that process. He fully endorsed what Mr. Onslow Ford had said as to the excellence of the castings produced by Mr. Singer.

Mr. J. Starkie Gardner said the four papers had been so excellent that there was really nothing to say about them in the way of criticism. With regard to one point raised in Mr. Graham's paper, he thought they must take it that metal was originally cast, and not beaten. They could not go beyond the prehistoric bronze period, and all the metal that they found of prehistoric date was cast metal, and, as far as they knew, it was all cast by something approaching to the sand process,—*i.e.*, it seemed to have been cast in a mould of rather porous stone, which, of course, in the case of simple castings was equivalent to the loamy sand now used. Mr. Krall had said that the value of the precious metals was formerly much greater than it was now, but he did not know what authority there was for that statement. So far as his (the speaker's) reading went, the precious metals of antiquity were of rather less value relatively than they were at the present time. Cast-iron was very much appreciated during the Renaissance, and he (the speaker) questioned whether Inigo Jones ever used anything but cast-iron, for he could not find examples of wrought-iron

* Abstracts of these papers were printed in last week's *Builder*, pp. 434, 435.

in any of his buildings; and Wren, as they all knew, used cast-iron for his railing round St. Paul's Cathedral, not because it was cheaper, for it cost 12,000*l.*, but because it was the very finest thing that he could do there. He thought no wrought-iron railing that could be put round the Cathedral could possibly look so noble and dignified as the present cast-iron railing. When properly used, cast-iron was not a brittle substance; it was only when we tried to do too much with it that it failed. There were many specimens of modern cast-iron work that were good and appropriate. As instances, Mr. Starkie Gardner mentioned the railing outside the New Travellers' Club and the park gates at Hyde Park Corner.

Professor Aitchison, A.R.A., said he had great pleasure in seconding the vote of thanks to the readers of the papers. Their friend Mr. Gilbert, the great sculptor, once told them that they made a great mistake in using bronze so little in their architectural work, and that where ornament was to be frequently repeated it could be modelled by our best sculptors and produced in bronze at a very small cost,—at a less cost, in fact, than it could be carved in stone. He (the speaker) happened at the time to have some internal work to do, and the owner wished all the capitals of a certain part to be alike. About a dozen of them had been ordered, but there were more to do, and it struck him that bronze could be successfully used for the purpose. Mr. Gilbert was kind enough to model one of those capitals for him, and they were cast in bronze and put up at a lower price than those which had been carved in mahogany. Bronze stood well in any climate, even in our own. It was true that it became ink-black in London, but still, it preserved its form, and was not made sufficient use of, considering that architects could now avail themselves of the skill of some of our best sculptors for modelling it. The objection to its use for the highest work of fine art,—the undraped human figure,—was that although it was almost imperishable if left alone, it was melted down in times of trouble. Thus several of Michelangelo's celebrated statues had been turned into halfpence or into cannon. So far as cast-iron went, they knew a good deal about it, but he was afraid that although they knew a good deal about it they did not make nearly the use of it that they might; and though he believed he was opposed to the views of most of the members of his profession, he still looked forward to a time when it would be used to a very much greater extent than it had been. He looked forward to the style of architecture of the world,—the civilised world, at any rate,—being entirely modified by its use. When brick, stone, and rubble were almost the only materials to be had, it was necessary that arched and domed forms should prevail; but now that we had a material that was enormously stronger in cross-strain than stone or marble, it seemed to him that our architecture should naturally take the form of the old post and lintel of the Greeks. Although he believed cast-iron could not be cast with the perfection of bronze, and could not be chased,—so that ornament on it might not be perfect,—still, when it was used on a large scale, it was obvious that in a thing that was removed many feet or many yards from the eye, elaborate fineness would be absolutely thrown away. Where columns 50 ft. or 60 ft. high were used, it certainly seemed unnecessary that they should have the same perfection in the finish of the ornament that would be required were they close to the eye. In concluding his remarks, Professor Aitchison recalled some interesting historical points connected with metal-working and metal-casting.

Mr. H. H. Statham asked Professor Aitchison how many centuries he would give for the duration of a monumental work of architecture in cast-iron? He once asked Sir Benjamin Baker how long the Forth Bridge would last, and the answer was that with proper care it ought to last five centuries. Now, mild steel, the material used for the Forth Bridge, would probably last a good deal longer than cast-iron, but even five centuries was a comparatively short period in the life of a monumental work of architecture in brick or stone.

Mr. William White, F.S.A., said he thought that if ever architecture should become iron, it would cease to be architecture.

Mr. Sydney Vacher said he had understood, from a gentleman who contemplated adorning a public work of his with bronze statuary, in place of either stone or terra-cotta, that, taking into consideration the fees which the sculptor would charge, his founder's bill would be so large as to prevent him from employing bronze statuary instead of statuary in other materials. It would be interesting if the meeting could be afforded some idea as to the percentage of difference of cost between executing statues from the clay in marble and executing them in bronze.

Mr. Pinker, in reply to the question raised by Mr. Vacher, said that bronze was certainly much cheaper than marble.

Mr. Singer said as to the relative cost of bronze castings compared with other materials, it compared most favourably with, and was far cheaper than, marble, and he only wondered that that metal was not more used for architectural enrichment, as, when a repeat of the same ornament occurred, the cost would be but little.

Mr. Onslow Ford, A.R.A., said it might interest the meeting to know that, if the same bust were carved in marble, and also cast in bronze, it would cost in marble, including the marble and the labour of producing it, from 35*l.* to 50*l.*; whereas in bronze it would cost from 20*l.* to 25*l.* He thought that was about the proportion.

The President having put the vote of thanks to the meeting, it was carried by acclamation, and,

Mr. Alexander Graham acknowledged the compliment on behalf of the readers of the papers. He said that the only point raised which he had to answer was that mentioned by Mr. Starkie Gardner with reference to early castings. He (Mr. Graham) had never for a moment doubted that the primitive races were acquainted in some way or other with the fusion of ore, but he had always doubted whether they were acquainted with the art of finishing the metal, whatever it was, into form, otherwise than beating it with a hammer.

The meeting then terminated.

THE ROYAL COMMISSION ON METROPOLITAN WATER SUPPLY.

WE resume our report of the evidence tendered before this Commission,* giving first analyses of the statements submitted to the Commission on behalf of the London Water Companies, in compliance with the request which the Commission had addressed to them, and then explanations offered by the witnesses called in support of the statements. In a conversation which took place at the last sitting, the Chairman said the Commission did not expect that any conclusions they might come to would be absolutely free from discussion, but they felt strongly they ought to narrow the field of inevitable discussion as much as possible, especially on such points as population, number of gallons per head, and area to be built over,—points on which all who had watched the inquiry would see that there was an "unusually wide scope for conjecture and for estimate." In order to secure the strict relevance and utility of the evidence, the Commission must receive in advance the fullest information, in writing or in print, of the points that witnesses were going to deal with; and, subject to that condition, the Commission would err on the side of letting in evidence rather than excluding it, especially on the larger branch of the inquiry, the geology of the Thames and Lea basins, and the available supplies of water. Mr. Hollams, on the part of the Water Companies, rather complained of the Companies being put upon their defence, and said it was for the County Council to support its vague accusations. The Chairman repudiated the idea of there being any accusation, but Mr. Hollams maintained it was for the County Council to justify the necessity for the Commission, and suggested that the County Council's witnesses ought to be cross-examined by counsel. But the Chairman would not hear of that. Mr. H. L. Cripps, on behalf of the County Council, said the justification for the Commission was the growing feeling in London that inquiry was really called for; and he suggested that the county of Hertford, represented by Sir Richard Nicholson, should precede the London County Council by tendering evidence on the conflicting claims of the London Water Companies and the county of Hertford to the water supplies of that county. The Chairman, however, desired first to hear the London County Council on the points involved in the first part of the enquiry,—population, requirements, present supply,—and then to take the larger question. Mr. Hollams complained that the Companies did not know what the London County Council's "case" was; and the Chairman said "We want to know, in the first instance, what everybody's case is, before everybody knows what everybody else's case is; and I am going to stick to that." Then Mr. Hollams claimed, and the Chairman conceded, the right of reply and refutation.

The Grand Junction Company.

This Company's statement named the successive sources of its supply,—Paddington, Chelsea, Kew Bridge, and Hampton, on the border of Sunbury in Middlesex. There are two intakes,—one at Hampton, and the other a mile higher up on an island opposite Kenton Court, Sunbury. Filters, reservoirs, and machinery are all adequate to any possible increase of demand in the near future. Besides the intakes, the Company has works, used for ten years, for the natural filtration of Thames water, which is passed through extensive beds of gravel and sand and then pumped into the reservoirs. The number of "supplies" of all kinds at the end of 1891 was 57,535; and the quantity of water pumped in the year (deducting for slip in the pumps) 6,203,000,000 gallons, or 17,000,000 a day. This is 7,500,000 short of what the Company may take. Constant supply prevails over four-fifths of the service, and will soon embrace the whole With good fittings, constant supply does not materially increase demand. Of the 57,535 supplies, 34,626 are within and 22,909 outside the county of London. These figures include 5,000 unoccupied houses. "The Census returns show 7·7 inhabitants for each town supply, and 5·4 for each suburban supply." (We quote these words because of a statement, mentioned last week, by Dr. Ogle, who is at the head of the Statistical Department of the Registrar-General's office, that the Registrar-General takes his figures from the Companies.) There are, therefore, continues the statement, 266,620 persons within and 123,708 outside the county of London; total, 390,328; or, deducting for unoccupied houses, 350,000. If the rate of building for the last ten years is continued for forty years (which is considered impossible), the population would reach 584,969, for whom 24,500,000 gallons would give 42 gallons per head. Tables support the conclusion that the population in both districts will not increase in the future as it has done in the past. The average number of persons per house within the Metropolis has fallen from 8·2 to 7·7, and the numbers of houses and of people have diminished in some parishes. In the suburbs the average per house has fallen from 5·6 to 5·4 in the past ten years. Within the Metropolis the number of supplies has actually decreased. The prevention of waste would make the present supply go further, but only a moderate supervision is exercised, because the supply is in excess of the demand. The storage is sufficient for seven days' consumption. Although five Companies take daily 100,000,000 gallons from the Thames, the lowest summer level remains unchanged. The Company are satisfied that they could, like others, augment their present resources by large supplies from the gravel beds and the underlying chalk. They have promoted a Bill to do this, but it was rejected by the Commons on the second reading. Official reports prove the good quality of the water now supplied, and the death-rate in the Company's districts is low. Taking the census returns of inhabited houses and population in six parishes,—St. James, St. George, St. Marylebone, Paddington, Kensington, and Hammersmith,—for 1881 and 1891, an appended table shows the average per house reduced from 8·2 to 7·7. The local averages are 9·4, 6·9, 9·2, 8·1, 7·5, and 7·0. The figures are also given for nine extra metropolitan places, and show a reduction from 5·6 to 5·4.

Mr. Fraser, the Company's engineer, was called, and explained that the natural filtration process was a totally different thing from the gravel bed supply of the East London Company. The filtration process was simply passing the river water through gravel beds.

* See *Builder*, pp. 418, 435, *ante*. It should be stated that in last week's *Builder*, page 436, second column, the scientific evidence as to the condition of the water in the Lea was (as mentioned in an introductory paragraph) given by Mr. W. C. Young, Consulting Chemist to the Conservancy Board, whose name was accidentally omitted at the commencement of his evidence, after that of Mr. Child.

The process was used only when the river water was bad. The witness held that the maintenance of the level of the river was a proof that it was not depleted by the Companies, although the Chairman held that the level was rather governed by the lock below. The present supply for all purposes, according to the figures, was 48 gallons per head per day. It was a high figure, no doubt,—11 higher than any other Company, and 17 higher than the New River. The quantities were right, the numbers of supplies were right, but the Company had no means of checking the population returns. The district included clubs and railway stations, which were large consumers. The Carlton Club was supplied by meter.

The Chelsea Company.

The Chelsea Company mentioned in their statement that they first took water from the Thames at Ranelagh. They were compelled by the general Act of 1852 to remove their intake above the influence of the tide; and they then got powers to take the water from the Thames at Seething Wells, Kingston. Next, to avoid discolouration from sudden floods in the Mole, in 1875 they removed the intake to West Molesey, four miles higher up the Thames. There are now four subsidence reservoirs, holding 140,000,000 gallons, sufficient for a supply of two weeks. The water is invariably bright and clear; few complaints are received from customers; and when bad colour is complained of it is found to be due to dirty cisterns or local causes. The reports of Messrs. Crookes, Odling, & Tidy, and of Dr. Frankland show the Company's water to be good throughout the year, and this is largely due to the capacity of the storage reservoirs, and the extensive filtration area. The average daily supply during the last twenty years is shown by a table to have varied from about 8,500,000 gallons to over 10,000,000 in 1885 and 1887, and 9,250,000, 9,500,000, and 9,750,000 in the last three years; and the number of supplies has risen from 27,949 to 35,630. Last year the maximum daily average for the month was 10,838,290 gallons in July, and the minimum, 9,351,607 in March. The daily average per head of the population was 34·6 gallons. The population of the district on December 31 was set down at 287,362 persons, and the number of houses supplied was 36,250. Shut in by the river and other Companies, the district contains only 523 unoccupied acres, chiefly in Fulham, and on these 10,500 houses may be built. Forty or fifty years hence there may be a total of 46,770 houses, which, at eight persons per house, will give a population of 375,000, and, at 35 gallons per head, will give a daily requirement of 13,125,000 gallons, or, say, a maximum of 15,000,000 gallons. The high average of eight persons per house is taken purposely. According to the Census returns for 1881, the average number of persons per house was 7·3, and in 1891 it had fallen to 7·1. Eight persons per house is a very full number to allow over the whole district. An average of 35 gallons per head is a very liberal estimate, because in the class of property likely to be built in the new district it is estimated that the outside quantity used will be 25 gallons per head, inclusive of trade supplies, road watering, &c. The eventual maximum of 15,000,000 is, therefore, a very full figure, The Company have power to take 24,000,000 gallons from the Thames during the twenty-four hours, and under an agreement with the Thames Conservancy they may take 2,000,000 more, making 26,000,000. This is more than double what is now taken, and 7,000,000 more than the estimated possible future maximum. The Company have machinery, capital, and spare land to meet increasing requirements.

Mr. Richard Hack, engineer, stated that the Company had abstained for as long as ten days together from taking water from the Thames. Three years ago all the four reservoirs were cleaned out, and, as a rule, one a year was done. The depth of the deposit was 4 in. or 5 in. The rate of filtration was $1\frac{3}{4}$ gallons per square foot of filtering area, the recognised rate being $2\frac{1}{2}$ gallons. The area of filtration was the reason of the specially good quality of the Chelsea water. The filtering beds were cleaned out every eight or ten weeks. The Company had experimentally taken water from the gravel 100 ft. from the margin of the river, and from a sample, Dr. Tidy had pronounced it to be spring water. There were no buildings near to pollute this water. The object in taking it would be to prolong the time the intakes from the river might be closed. The limitation on the river supply applied to each twenty-four hours; and one day's deficiency could not be made up by excess on another day; but if 3,000,000 gallons were taken from the gravel it would not be part of the river supply. The gravel area averaged 8 ft. or 10 ft. in depth, overlying the clay down the valley from Windsor.

Mr. A. C. Gill, a district engineer, said that in the returns empty houses were balanced by a delay of six months in reckoning new houses. He thought the census taken at Easter was misleading, because many persons would be out of town; but he was reminded that many of the residents of St. George's, Hanover-square, were out of town eight months in the year, so that the Easter census would fairly approximate to the average. He admitted the importance of discrimination in speaking of houses, tenements, and supplies, and on this point had a long conversation with Dr. Ogle, who referred to model dwellings as a disturbing element in estimates and approximate returns. With rigid inspection, there was no reason why constant supply should lead to greater consumption, but, with the Company's surplus of water, waste was not of great consequence.

Mr. G. H. Gill, the Secretary, said the Companies' Act gave them the power to take water from any springs on their own land.

The Southwark and Vauxhall Company.

In the statement submitted by this Company, the following figures are given: 24,500,000 gallons may be taken daily from the Thames; 3,000,000 can be obtained from "collecting works" at Hampton,—"natural filtration works," which cover an area of $39\frac{3}{4}$ acres; 3,000,000 may be obtained from the well at Streatham. 30,500,000 is thus the total quantity available. 10,500,000 may be obtained from seven wells yet to be sunk. 43,000,000 gallons is, therefore, the prospective supply. 25,000,000 gallons is the estimated requirement in 1932 for a possible population of 1,215,457, at 25 gallons per head, $18\frac{1}{2}$ or 19 for domestic supply, and 6 for trade supply. The Thames, it is said, could afford a much larger quantity than is at present abstracted from it, not only from the daily flow, but by storage in reservoirs, which would be constructed as required. "All the sources and statistics point to the fact that the Company has sources of supply within itself, or at its doors, which will meet all requirements for a period far beyond that for which any reliable estimate can be formed. Neither would the Company be at any difficulty in raising the capital for the extra works as they become necessary, the experience of the past proving that the increased revenue is more than sufficient to meet the increased interest on dividends which will become payable on the increased capital." The object of the works in progress at Streatham is to obtain an auxiliary supply from the chalk. A boring has been sunk through the chalk to a depth of 1,142 ft. With the temporary machinery $1\frac{1}{3}$ gallons were pumped daily for weeks. The maximum depression it has been possible to effect in the level of the water has been from a depth of 48 ft. to a depth of 97 ft. from the surface. It is, therefore, inferred that a supply of from 3 to 4 millions can safely be estimated as available from this source after the completion of the works in the course of next year.

The present total supply is 23,653,412 gallons daily, which, with an average population of 841,989, equals 28·09 gallons per head, of which 5·89 is for trade purposes, leaving 22·20 for the actual domestic supply. In the districts constantly supplied (now 87,310 "supplies" out of 113,781), the waste-water-meters show the progressive reduction of the supply per head for domestic purposes only to 24·71 for 1887, 20·72 for 1888, 19·57 for 1889, 18·53 for 1890, and 19·70 for 1891. It is in this experience that the future estimate for domestic supply is reduced to $18\frac{1}{2}$ gallons.

Full details are given as to storage, pumping, and filtering. At Hampton are three storage reservoirs that hold 20,000,000 gallons; a new one is proposed, to hold from 50,000,000 to 60,000,000 gallons. The filtration works cover $39\frac{3}{4}$ acres; three filters $3\frac{1}{4}$ acres; an extension will make this filtering area $7\frac{1}{2}$ acres. At Battersea are reservoirs for 46,000,000 gallons, and $11\frac{1}{4}$ acres of filters; at Nunhead, reservoirs for 18,000,000; at Forest Hill, reservoirs for 1,000,000 gallons.

Mr. J. W. Restler, engineer, in his evidence mentioned that one of the reservoirs at Hampton was being converted into filters, and thus the storage was reduced to 60,000,000 gallons, equivalent (as the Chairman said) to less than three days' supply; but (said the witness) there were in addition 21,000,000 gallons of filtered water stored. That would add a day's supply, although the storage of filtration water could not be "depleted to nothing at all;" but the company did not lay any stress on storage. The intakes from the Thames were never closed completely. "You take flood water at all times?" "Yes, we have to take it." But this involved no disadvantage as regarded quality. Of course, the filters were clogged more rapidly, and they had to be cleaned more frequently. The early flood water was the worst that had to be dealt with, but the draught of it was minimised, because at times of flood the "natural collecting works" gave one-half the supply. These works were used in two ways. Water was taken from the ballast beds first, without any water from the river. The ballast beds were also charged by means of pipes directly from the river. The Thames water was often let into the gravel bed; but in times of flood this was quite unnecessary, because there was so much water in the ballast itself that 10,000,000 or 12,000,000 gallons a day could be pumped without difficulty. This water did not come from the river, because the level in the ballast was higher than the level in the river. At that point the river was coated over with a very thin suspended clay,—a sort of puddled surface. The sides of the river seemed to be practically tight. Sometimes this water was pumped into subsiding reservoirs, but as a rule into filters. Dr. Tidy had described it as magnificently pure water; and, seen through a 2-ft. tube, it was clearer than the ordinary artificially-filtered water. He did not regard this as Thames water, although ultimately it might find its way into the river much lower down. He thought the Thames itself flowed through the centre of a ballast bed, which extended from about Staines right down almost to the metropolis. The whole bed was charged with water, and it must at some time have got charged from the Thames, but he did not think there was any direct connexion, certainly in that neighbourhood, between the Thames and this ballast water. When building operations threatened the purity of this source of supply, this company and the Grand Junction constructed a puddle wall between the Thames and the outcrop of the ballast, at the northern end of the works. That reduced the quantity to be obtained from them; and so it was put down at 3,000,000 gallons instead of 5,000,000 gallons; but the lower side remained unaffected by the wall; and on that side any sources of pollution were too remote to affect the water. Describing the works at Streatham, the witness said the level of the ground was 110 ft. above ordnance datum; the well itself was 10 ft. in diameter down to 148 ft. from the surface; it was 9 ft. in diameter down to 191 ft. from the surface; it was 7 ft. 6 in. down to 244 ft. from the surface. When the sinking was being made, the water broke in at a depth of 212 ft. from the surface. It was really in the Thanet sand formation the water was found; the cylinders were carried down to, but were never actually sealed into, the chalk. The cylinders are in a bed of flints, practically on the chalk; but, of course, overlying the chalk. From that point a 30-in. boring was taken through the chalk to a depth of 813 ft. Then there was some 24-in. pipe, which went through the sandy chalk and marl. Below that, a length of 20-in. pipes go through the upper green sand and the gault to 937 ft. Below that, again, there is a line of 18-in. pipes, which are all in the gault. They go right through the gault; and at 1,073 ft. is reached a sort of red sandstone. There the boring was reduced to 15 in., and it went down to 1,094 ft. 6 in. After leaving the chalk, the whole boring was lined down to the bottom of the gault. There was a 4 in. boring,—a trial boring, really,—and that was taken down to 1,271 ft. That was also in the sandstone. There were no faults met with till quite the last few feet, and it was just a point whether it was the old or the new red sandstone. It was not green sand; the lower green sand was never found at all. There were just traces of what was supposed to be the lower green sand after the gault, but only traces. The machinery was put down primarily with the object of draining the well, so as to get cylin-

ders into the chalk and drive headings. The capacity of the pumps was under two millions a day, and, running them hard, the water could never be got lower than 98 ft. from the surface, so that the water was depressed by pumping 49 ft. Water was not being pumped from the Streatham well. The official sanction had just been received to use it as a source of supply. When the machinery was up, he had no doubt they would get 3,000,000 gallons a day. The seven wells that were to give 1,500,000 gallons daily were not sunk yet. Some fourteen years ago the advice of a number of eminent geologists was taken as regarded the best positions and the quantity of water that might be derived, and this estimate was based upon the reports they sent it. The Company had power to sink wells anywhere, and to take water therefrom. The Company's storage would be small for the large quantity of water used if it were not for the 10,000,000 or 12,000,000 gallons of naturally filtered water obtained when it was most needed.

Asked by Professor Dewar to explain why in December, 1891, the company's water was the only water that was turbid on six occasions, he said it was a difficult matter to trace, because they did not know of the analysis until a month after it was made. The same as to February, 1891. It was not that there was any lack of filtering area. If it was coincident with the taking in of flood water, it would look as if that was the explanation. On days when he had expected a chance of turbidity, because the filtration was working at its maximum, there had not been complaints, and for days when he thought they were all right complaints had come a month afterwards. The extension of the filters would reduce the chance of this trouble, although he would not say it was due to bad filtration. Sometimes he had thought it was due to samples being taken from points at which the water had been lying stagnant in the main. The points and the dates could be traced, and Professor Dewar remarked that it was certainly strange that the complaints should occur only in the case of this company. The average rate at which the filters worked was two and a half gallons per square foot, but at Hampton it sometimes reached three gallons. There did not appear to be any relation between the turbidity and the rapid working of the filters.

Dr. Ogle asked the witness to explain the curious fact that the amount per head given by this company was only about half that given by the Grand Junction. He said the Grand Junction gave constant supply, in reliance upon the house-to-house inspection of fittings. If this company did the same, its supply would be from 58 to 60 gallons per head. But the company checked its whole supply by waste-detection meters,—automatic registers,—which detected an enormous amount of waste that would never be seen otherwise,—waste from underground pipes and broken services, and numberless other causes. In addition, the company kept a check on the fittings by regular inspection. There would be less consumption on the intermittent system if the fittings were as good as for constant supply; but with better fittings the consumption was lessened by constant supply. It would be infinitely less if there were the same control over fittings that there was in the Midlands and the North. In some fairly respectable, small houses of £27 or £28 a year, where proper care was taken of the fittings, the supply was only 6·73 gallons per head per day. These houses had closets, but not many had baths. Baths and hot-water supplies did not much affect the consumption, and there would be an ample margin for them if waste could be checked. If the waste-meter system were adopted universally throughout London, the average consumption could be reduced to 24½ gallons. It was specially difficult to give constant supply economically in this company's poorer localities. If the water were shut off, the people would steal the fittings and sell them.

Mr. Joseph Lucas, called as a geologist, said in the course of his evidence that there were no scientific means whatever for forming an opinion that would be worth the paper it was written upon as to the quantity of water that could be obtained from the Streatham well. Still, he believed it was probable the 3,000,000 gallons expected would be raised when the machinery was completed, in eight months' or a year's time. The Streatham well water, he believed, came from the Wandle, which had a volume of 17,000,000 to 20,000,000 gallons a day. The pumping dried artesian wells at Tooting, but that only prevented the water running to waste in the Wandle.

Mr. Wm. Topley supported the opinion that it was probable the well would yield 3,000,000 gallons daily. The pumping affected a well at Teddington and one at Anerley.

The Lambeth Company.

This Company's statement is a descriptive and historical review occupying twelve closely-printed foolscap pages, and divided into sixty-seven paragraphs, which include several statistical tables. The principal source of supply is the Thames, from which 24,500,000 gallons may be drawn daily, and this may be augmented by from 6,000,000 to 8,000,000 gallons from the gravel beds, which were discovered and utilised in a manner analogous to that described in the case of the East London Company. From 7,000,000 to 8,000,000 gallons are taken when the Thames is in flood and the river intake closed. Borings have been sunk to the chalk, and reported on as favourable sites for wells, but none have been sunk, as there is a large margin in the present supply, and larger quantities can be taken from the Thames and impounded in storage reservoirs to meet future needs and to tide over periods of flood on drought. At West Molesey, where the 24,500,000 gallons may be taken, the capacity of the pumping power is 42,500,000 gallons, and of the subsidence storage 125,000,000 gallons. The filtering area at Ditton is 9½ acres; and the capacity of the covered reservoirs for filtered water is 28,750,000 gallons. There are large margins of pumping power at Ditton and at Brixton Hill. As far as this company is concerned, there is no need for a supply from Wales or any distant source. The company can meet any demand likely to arise in its district for the next forty years. A great saving can be effected in the present consumption by the prevention of waste. It is believed that by the use of waste meters and by inspection, the consumption is now 7,000,000 gallons less daily than it would have been with the same population in 1871. The following are daily averages in gallons for the last three years:—

	Pumped.	Per Supply.	Per Head.
1889 ...	18,235,739 ...	204 ...	29·17
1890 ...	18,776,432 ...	205 ...	29·35
1891 ...	19,736,466 ...	213 ...	30·36

The following figures exhibit the decrease in the average daily consumption:—

	No. of Supplies.	Population.	Gallons per Head.
1871 ...	45,000 ...	295,000 ...	44·04
1881 ...	69,123 ...	483,861 ...	36·76
1891 ...	93,703 ...	655,921 ...	30·36

Mr. S. H. Louttit, Secretary and General Manager of the Company, said that the gravel-beds extended from the river for some miles inland. The Company were entitled to take the 8,000,000 gallons from the gravel in addition to the 24,500,000 gallons from the river. The water was not practically abstracted from the Thames. At a long inquiry by the late Mr. J. T. Harrison, in 1880, the question of this underground water was gone into very fully, and Mr. Harrison and Col. Hildyard, his assessor, concluded that the water came from the direction of the Bagshot sands, and came under these gravel beds in very large quantities. During the severe frost of 1890–91, in eight days 54,750,000 gallons of this water were pumped, and there was no trace of exhaustion or diminution at the end of that period. The chance of pollution was very remote, the nearest building to this source of supply being a cottage three-quarters of a mile away. Chertsey was six miles from the intake, and the pollution from that district would flow into the Wey. The largest average daily quantity of water ever pumped was 22,561,743 gallons, in the week ending January 23, 1891. The calculation of the future available supply depended partly upon the estimate of what could be saved, which was pretty well known. The constant supply question had been gone into scientifically, and every district with constant supply was under one of Deacon's waste meters. These gave daily records of the water passed, and their use, coupled with inspection, showed what could be saved. It was from the experience thus gained he concluded that, taking the whole district, 22 gallons per head per day was an ample supply. Some divisions recently inspected gave 19·53 per head, and, as compared with the half year ending March, 1891, the half year of the greatest frost, it was a reduction of a gallon per head. In four new districts in Streatham, the average was 21·16. The saving by constant supply for the past twenty years amounted to 75·91 gallons per supply. At the rate of supply of 1871, the present total would have to be increased by 7,112,843 gallons, to 40 gallons per head; and yet the supply was better now than it was then. When great waste was discovered in a meter division it was inspected, and defects remedied, and that generally brought the average down to 12 or 14. After a short time it went up to 18 or 20, and then another inspection brought it down again. The meter supply, and that for road water and sewer flushing was about 23 per cent of the whole supply, or 6·36 gallons per head per day, and this made the total 26·87. In the past, when consumption was largest, there were great complaints about pressure, because water would not reach the upper services; but there were no such complaints now. Supplying statistics that had been asked for, the witness said that 22,561,743 gallons was the highest daily average for a week,—that ending January 23, 1891; 20,557,884 gallons was the daily average for December, 1890, and January and February, 1891; 20,268,231 gallons was the daily average for July, August, and September, 1887; 20,439,600 gallons for July, August, and September, 1889; 20,420,820 gallons, for January, February, and March, 1891; 28,411,025 gallons might be required in 1931 to give 25 gallons per head per day; 30,500,000 gallons were now obtained from the Thames and the gravel beds, and this is "irrespective of the water that can be obtained from the chalk. The directors are advised that they can obtain 3,000,000 gallons per day from a well at Selhurst, where they have just sunk a boring." In a final explanation on the statistical question Mr. Louttit said he had taken a population of eight persons per supply in constant supply divisions, and that was a reasonable figure, considering that the supplies were in the most thickly-populated parts of the district. The census returns of inhabited houses confirmed the correctness of the returns submitted by the companies in a remarkable manner. The population worked out at exactly seven per house in the Lambeth Company's district.

Mr. T. F. Parkes, the Company's Engineer, said he desired to emphasize what had been said as to Companies having more control over fittings. If they had as much as provincial Corporations and Companies, the reduction of waste would be facilitated. The Company ought to prescribe the fittings to be used, and not the builder. He would have the fittings brought to be stamped by the Company as approving of them. He would not limit the supply to the fittings of any selected tradesman, but would have free trade in fittings provided they were efficient according to a recognised standard.

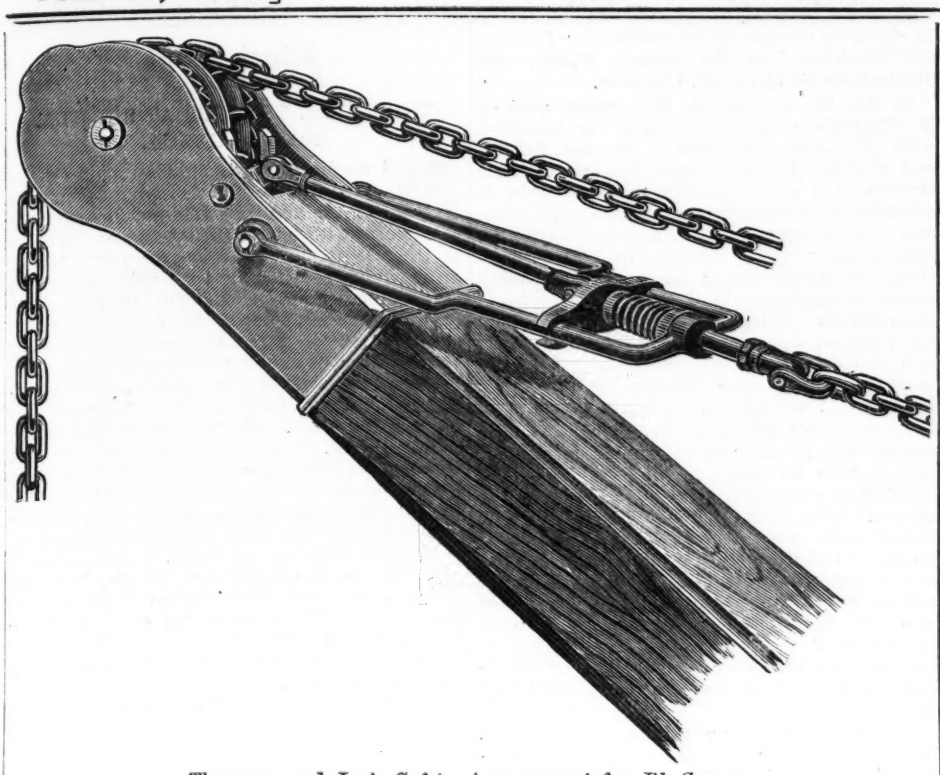
In answer to Mr. Mansergh, he said that of the 19,000,000 or 20,000,000 gallons supplied from Brixton, about 9,000,000 gallons were supplied by gravitation, and the balance was pumped to Streatham, Selhurst, Norwood, or Rockhill, which was a maximum lift of 387 ft., to which must be added 25 ft. more over a standpipe.

Questioned by Professor Dewar as to the water being turbid on nine occasions in February, he said the filters were acting perfectly, and something must be due to the place where the samples were taken. This was the cab-rank in St. George's-road, and it was not near a dead end, but it it was in the centre of the main.

Evidence concerning the Kent Company was then taken. We have a report of this in type, but must defer it until next week for want of space.

After the Whitsuntide holidays, the Commission will hear the cases of the Hertford County Council and the London County Council, which are expected to traverse that of the companies as to the sufficiency and fitness of their resources.

ASSISTANT-SURVEYORSHIP, NEATH. — At a meeting of the Neath Rural Sanitary Authority on June 8, the salary of the Assistant-Surveyor was increased from 104*l.* to 120*l.* per annum.



Thompson and Lea's Safety Arrangement for Jib-Cranes.

A SAFETY PROVISION FOR CRANES.

THE erection of modern edifices, particularly those of great height,—which so many now-a-days are,—has involved the increased the use of "Scotch" derrick-cranes for the hoisting of materials. The accidents which happen with these cranes are quite different from those which occurred in the days of the hod. But it is only when the nature of the accidents with the derrick is considered over any extensive series that one sees that it is not so much from the load being dropped, or by any failure of the heaving-chain or gear, that accidents occur, as it is from what at first sight seems a minor source altogether. It is the jib-chain of the derrick which is most frequently in trouble. The danger from the jib is twofold. If it comes down by the run, it smashes interior staging or external scaffolding and walls, and everything in its way. If it be suddenly brought up by a check-chain, the whole derrick may be canted, and there is worse wreckage still. It is granted that these accidents are infrequent; they are nevertheless very ugly matters when they do occur. The chief source of evil in the "jib-chain," or the chain which passes from the head of the jib to the top of the derrick-mast, is not so often from breakage as from the chain being unavoidably short, and therefore apt to run off from the drum. No effective remedy for this has hitherto been provided. The most that has been attempted has been to put a second loose chain lower down between the jib and the mast. This is no real security, but a delusion.

What has now been done by Messrs. Thompson and Lea is a very simple and efficacious arrangement introduced into the ordinary metal head of the jib, whereby the instant that the jib-chain breaks or ceases to hold, the heaving-chain takes up the jib and maintains it as well as the load at the end of it. What is done is this:—The pulley over which the heaving-chain runs has ratchet teeth attached to each side, and in the stirrup to which the jib-chain is usually fastened there is a hooking-on rod provided with a spring at one end and a lever at the other attached to the two pawls which work into the ratchet teeth. When the jib-chain is holding on, the spring is drawn home and the pawls are kept out of contact with the ratchet teeth. But if the jib-chain breaks or becomes loose, the spring, being released from compression, pushes forward the lever, and the pawls engage with the ratchet. Thus the pulley is immediately gripped and the links of the heaving-chain are imprisoned in the pockets of the pulley, the jib being thereby as firmly grasped in its angle of position as it was by the jib-chain itself. The merit of this invention is that the remedy for the accident is so close at hand, and that of two chains running side by side, the one takes up the work of rescue the instant the other gives way. The spring is not a cumbrous affair, the side ratchets add very little to the dimensions of the pulley, the stirrup is no longer than the one in ordinary use, as the rod and the spring work within it, and the lever and pawls within the head in the space behind the pulley. (See illustration.)

In some tests of the appliance which were made on Wednesday on the Albert Hall Estate by the contractor for the new buildings of the Royal College of Music, a three-ton derrick crane, fitted with the safety appliance here described, was employed. The jib was 45 ft. long, of 10½ in. timber, and weighed 15 cwt. A large block of stone was slung on the end of the heaving-rope, and the jib-chain, hauled taut, was secured at the drum end by a hemp rope. The chain on the drum was then unwound, so that the rope held the jib. This rope was then cut with a hatchet, and the metal head of the jib did not fall 6 in. before the spring lever and pawls had acted, and the jib was firmly held by the heaving-chain on the pulley. This experiment was repeated many times with the like results. A model derrick, showing a modification of the invention to cranes in which wire ropes are employed was also experimented with, and gave equally successful results.

MAGAZINES AND REVIEWS.

The Gazette de Beaux Arts contains an article by M. Edmond Pottier on "The Salons of 1892," a well-studied and thoughtful piece of criticism. The writer maintains, at the outset, that two conclusions are to be drawn from the present condition of French art as shown in this year's exhibitions; first, that the study of the art of the past has not shut the eyes of artists to modern subjects; secondly, that the restlessness of modern art does not represent "une marche aveugle vers les abîmes," but that there is a vital principle to be discerned in it. The various nude studies of the present period, M. Pottier regards as the direct legacy from Greek art; the very names of classical legends or personages appended to them indicate this; the varieties of treatment are great, but the true source of inspiration is the same in all. In connexion with this portion of the subject M. Pottier urges that a closer study of the silhouette figures in Greek vase-painting is worth the modern painter's attention. The taste for allegory shown at present in French art is a kind of reaction against the influence of realism; M. Benjamin Constant's decorative picture shows a desire to escape from the commonplace and prosaic treatment of allegory: "The ideal is eternal." In summing up, M. Pottier concludes that modern French art is under the domain of two distinct influences; the great style of Italian Renaissance, coupled with a research after special effects of colour and lighting derived from the great Dutch painters. M. Salomon Reinach contributes an article on the museum of antiquities at Vienna, with some fine illustrations of early Mediæval sculpture. M. Germain Bapst has an interesting article on "La Décoration Théatrate à la cour de Louis XIV.," giving curious illustrations of the rich but preposterous costumes designed for ideal characters on the French stage of the period; "Diana" in a gorgeous flounced dress, with feathers on her head, and a bow and arrow in her hand; and other extravagances of similar type.

The *Revue des Deux Mondes* has its article on the Salon, starting with a view the very reverse of that of M. Pottier in the *Gazette*, and regarding contemporary art as of an anarchist or nihilist character. There is too manifest a struggle to astonish, to gain notice from the press, and the *Revue* recommends the artists to live more to themselves and to the thoughtful study of their art, and think less of the public and the journalists; advice certainly not uncalled for in France at present. The old Salon it notes as "less unquiet" in its aims than the new. The *Revue* makes the same comment which we made in regard to the paintings for ceiling decorations at the old Salon,—that it is impossible to judge rightly of them when hung on a wall, in a perfectly different position from that in which they are intended to be seen.

In the *Art Journal* an article on "Some English Shrines," by Mr. Vernon Blackburn, gives descriptions of shrines in various English Cathedrals,—that of the Black Prince at Canterbury; Bishop Hatfield's, at Durham; Wykeham's, at Winchester; Edward the Confessor's at Westminster; with illustrations by Mr. Symington, which give the chief value to the article. "The Private Art Collections of London" this month deals with Sir John Pender's collection at Arlington-place, with illustrations of some of the rooms and pictures, the latter including Sir F. Leighton's popular and pretty "Phœbe." Mr. R. J. Slade contributes an article on "Mr. Thorne Waite," and Mr. Claude Phillips commences some articles on the summer exhibitions at home and abroad which are well illustrated, and as thoughtful criticisms are welcome reading in comparison with the foolish and malevolent literary onslaughts on painters which seem the fashion of the day.

In the *Magazine of Art* the Editor gives a review of the Royal Academy — somewhat *couleur de rose*. The first page is occupied with an endeavour to justify Mr. Watts's "She Shall be Called Woman," but we fear it is unconvincing. That Mr. Watts has formed a very lofty intellectual and moral ideal of the art of painting we all know—honour to him for it; but it is no less evident that his ideal has occasionally led him to forget the realities of pictorial representation. An article on "Scenic Art," by Professor Herkomer, is of rather special interest. He attacks the conventional arrangement and lighting of the stage, and gives two pictures of the actor as seen from the gallery and the actor as seen from the stalls, to show the absurdity of anyone posing for an audience distributed over so large a vertical angle. Quite true, but the question is, how is a house to pay without galleries except at a higher average of prices? Professor Herkomer also gives sketches of the face as lighted from the footlights and the face in diffused light; and explains that his own abandonment of footlights at his Bushey Theatre was originally only a happy accident. We rather doubt, however, if footlights will be disestablished. They have the advantage at all events of separating very completely the players from the audience, leaving the players more isolated from the spectators and consequently with a feeling of greater freedom. To remove the footlights would be like taking down a wall of partition. "The Pupil of the Eye as a Factor of Expression," by Dr. Wilks, is a short practical paper from the physiological point of view, which may be suggestive to painters. In another article Mr. W. F. Dickes replies to his critics in regard to his theories on Holbein's "Ambassadors" picture.

In the *Antiquary* Mr. Ward continues his "Notes on Archæology in Provincial Museums," dealing in this number with Shrewsbury. A short article called "The Antiquary among the Pictures" suggests a review of archæological lore as exhibited in Royal Academy pictures

but in fact it does not draw any attention to questions of archæological correctness in painting, which might very well and usefully occupy such a journal as the *Antiquary*, but is mere chit-chat without even an attempt at criticism; a kind of writing that is of little value. Mr. Henry Barber contributes an article on the Cistercian Abbey of Maulbronn, with birds-eye views (from old representations) and a plan.

The *Fortnightly* contains an interesting and learned astronomical article by Mr. W. Huggins on "The New Star in Auriga," and a remarkably insolent and violent article on "The Royal Academy Exhibition" by Mr. G. Moore, whose qualifications for the assumption of the status of an *ex cathedrâ* critic may be sufficiently estimated by the fact that he proclaims Mr. A. Moore and Mr. Whistler the two greatest artists of the day, whose non-acceptance by the Royal Academy into its ranks is the *teterrima causa* of Mr. Moore's wrath against that body. The grouping together of two painters of such opposite aims as representing the highest achievements of art is amusing; one might almost be inclined to say that if Mr. A. Moore is right Mr. Whistler must be wrong, and *vice versâ*. Some of the writer's criticisms on individual artists and individual pictures are just enough; but the whole tone of the article is offensively typical of the spirit in which literary men seem nowadays to think they have the right to dictate about art. The same number contains an equally one-sided and conceited article on "The Two Salons," signed Elizabeth Robins Pennell. In the eyes of these two modest critics, it should seem, nearly all painters are fools, and all exhibitions contemptible. The tendency of reviews to the publication of this kind of literary abuse of contemporary art is a very disagreeable sign of the times.

The *Nineteenth Century* contains an article by the gifted lady who writes under the name of "Vernon Lee," on "The Tuscan Sculpture of the Renaissance," an article which however is rather ingenious than convincing. It is a comparison between Greek and Renaissance sculpture, with the object of proving that the latter is more truly decorative sculpture; that the Greeks only sought to give the human form correctly in a manner based on clay modelling, while the Tuscan sought for the decorative effect of the figure. It is noticeable that the writer only refers to Greek sculpture as work in the round, and appears to have entirely forgotten the Parthenon frieze, to which not the slightest reference is made. Such an omission is in itself sufficient to very much weaken the argument; and we may add that if Vernon Lee really believes that the Greek Doric style of architecture consisted of "little more than the imitation of the original carpentering," she has a good deal to learn on that subject.

The *National Review* publishes an article by Mr. E. J. Gibbs on "London and Rome," a comparison of the two cities in regard to wealth, influence, and agreeableness. Mr. Gibbs brings forward reasons for thinking (as we have always thought) that the immense wealth of Rome under the Empire has been little realised, and that it was positively and not only comparatively as great as that of London, while its standard of luxurious living was incomparably higher (or lower); and that in population Rome was more on a par with London than at first appears, the suburban districts not counting as part of Rome, as in these days they count as part of London. In comparing the advantages of life in the two cities Mr. Gibbs emphasises the fact that in ancient Rome every citizen could have the run of bathing establishments on such a scale of luxury as the world has never seen equalled, for the payment of an entrance fee equal to about half a farthing.

In the *English Illustrated* we find another of those articles on great railway workshops which are now becoming rather a fashion, each railway taking its turn apparently; now it is "The Midland Railway Locomotive Works at Derby," by Mr. C. H. Jones, an assistant locomotive superintendent of the Midland, with illustrations from photographs taken by Mr. Scotton, the company's official photographer. Though there has been a good deal of this lately, we like to see such such articles, which may give the readers of popular magazines a little better idea than they have at present of the colossal and varied labour which underlies the daily work of a great railway establishment. In the same number is an article on "Dunster and its Castle," by Mr. Graham Wallas, with illustrations by Mr. E. W. Charlton.

In the *Revue Générale* the greater part of M. Trogan's "Lettre de Paris" is occupied with the leading pictures in the two Salons, and though this is a mere magazine article written in a somewhat light-hearted style, it contains in a bantering way much good sense and sound criticism, as well as some happy hits, and is quite worth reading in both senses. Over the tendencies of some of the leading works of sculpture M. Trogan is melancholy; M. Gerôme's "Bellona" suggests to him a sign for a dentist, a patient opening the mouth wide; and the colour statues represent "L'art du boudoir. Qu'on nous redonne les Dianes de Falguière"; and one cannot but echo the wish.

IN *Scribner's Magazine* Mr. Shaler gives his second article on "rapid transit in cities," giving "the solution" of the problem. His solution is apparently electric railways in the streets. This, however, pre-supposes (after the horses have ceased to be frightened by them) streets of sufficient width to allow for this alongside of the ordinary traffic. In many cities the streets where rapid transit is most demanded will not admit of this; and it is too late to rebuild them. The American's objection to underground railways is neatly put—"Americans do not like to go underground until they are dead."

The *Century* has an article on Budapest, under the title "The Rise of a New Metropolis." It is illustrated by sketches by Mr. Joseph Pennell, which convey some idea of the remarkable manner in which this city has attained, in so short a life, to the appearance of a first-class modern city. An article on "Early Political Caricature in America" contains many reproductions of old carricatures, remarkable for vigour and malice, though a good deal of their point is necessarily lost now.

To *Harper's Magazine* Professor Waldstein contributes an article on "Funeral orations in stone and wood," relating especially to the bas-relief of "The Mourning Athene from the Acropolis," which forms the frontispiece to the number, and which is a curious mixture of archaic style and comparatively late or "modern" sentiment. The knowledge we now have of the existence of an archaic or "pre-Raphaelite" school in later Greek art might have been supposed to furnish the explanation of this; but Professor Waldstein is disposed rather to regard the bas-relief as the work of a sculptor trained originally in the earlier and stiffer technique, but who had entered into the more poetic sentiment of the later day. He would suggest about 470 B.C. as the probable date of the work.

In the *Atlantic Monthly* is a continuation of the interesting article on "Private Life in Ancient Rome" by two ladies, to the first part of which (in the preceding number of the same magazine) we have already referred. In the same number is a pretty little poem in praise of "Nuremberg," by Julia R. C. Dorr.

The *Cornhill Magazine* includes a short article on "Curiosities in our Cathedrals," a readable summary of some out-of-the-way peculiarities in the design or the contents of various cathedrals which are not popularly known, though familiar to archæologists.

All the Year Round includes a fairly good article on "The Loan Collection of Pictures at the Guildhall," followed by a pleasantly-written chapter on "Florence in Spring."

THE ENGLISH IRON TRADE.—With the intervention of the Whitsun holidays the English market remains very quiet. In Cleveland, many of the works will be started as soon as a sufficient supply of coke can be obtained; but work will not be in full swing for some weeks. No. 3 G.M.B. is firm at 41s. 9d. There is practically no change to record with regard to any of the other pig-iron centres. In tinplates the volume of business passing is fair; but the manufactured-iron trade continues dull. Steel works are also inactive. Shipbuilders are less brisk, and engineers remain dull. The coal trade is rather quiet.—*Iron*.

THE NEW CROSS-COUNTRY RAILWAY.—At Chesterfield, on the 7th inst., Mrs. William Arkwright performed the ceremony of cutting the first sod of the projected trunk railway line, which is to cross England from sea to sea. The new railway, which is 175 miles in length, will form a connecting link between the eastern and western coasts.

Illustrations.

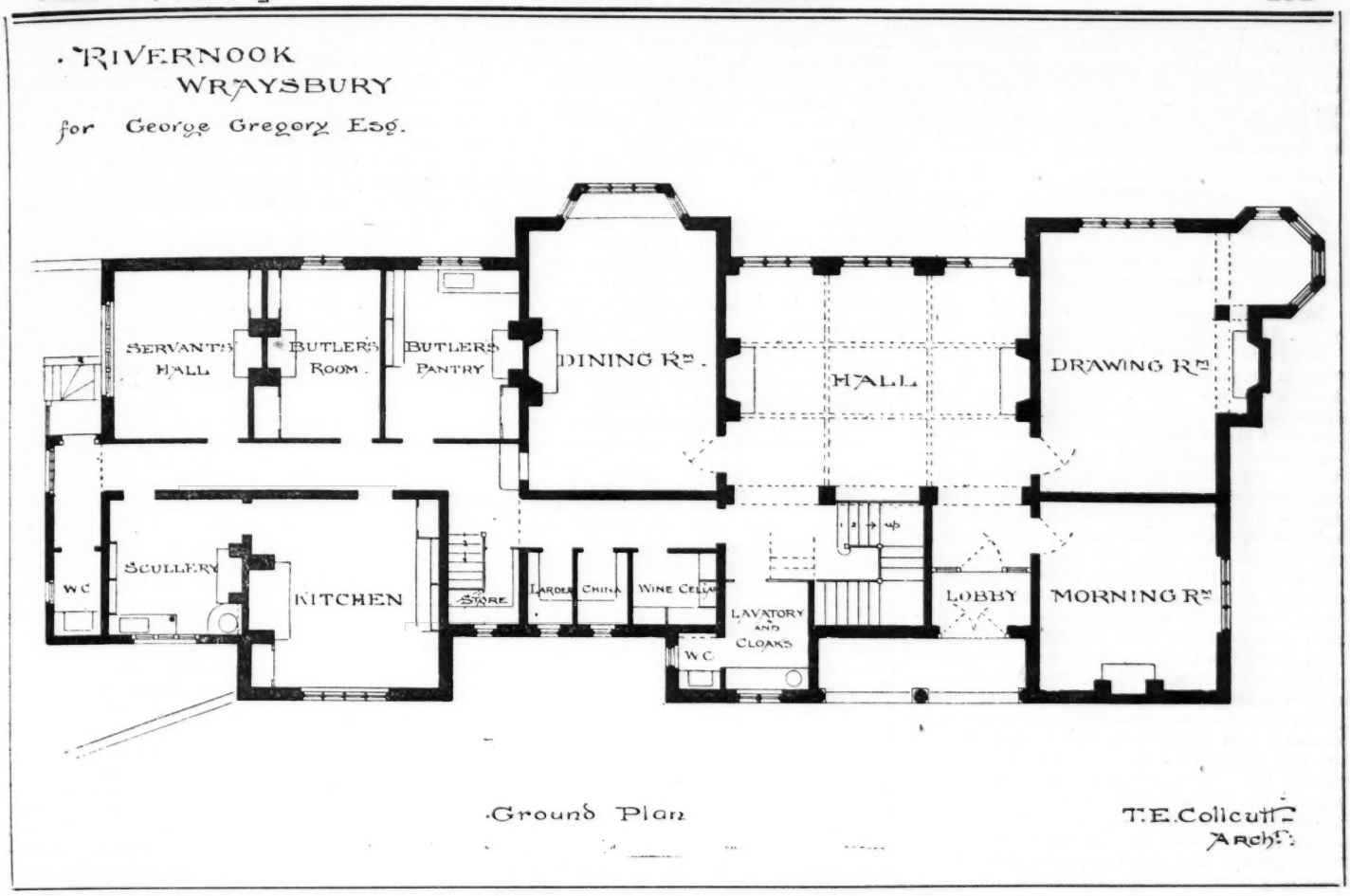
THE THREE TEMPLES AT SBEITLA, NORTH AFRICA.

AS we have commented strongly on the procedure of the Hanging Committee of the Academy this year in regard to architecture, especially with reference to some of their rejections, we may give point to our criticism by mentioning that this interesting restoration of three Roman temples from existing remains, by an architect who has given special attention to the illustration of ancient Roman work, is one of the drawings which the person who looked after the hanging of the architectural drawings (whoever he was) considered not worth a place. The rejection of a drawing such as this, by an architect who can not only bring archæological learning to the subject but can make his own drawings, while space is found for commonplace houses bearing the names of men who have to pay a draughtsman to make a drawing for them, is discreditable only to the Academy, not to Mr. Graham, whose work would no doubt have found a good place among the architectural exhibits of the Salon, though it did not recommend itself to the eye of the carpenter in the Royal Academy architectural room.

Mr. Graham sends us the following article in respect to the site and restoration of the temples:—

"A glance at a map of North Africa is necessary to give the reader an idea of the geographical position of Sbeitla. Three days' journey from Tunis, either along the coast by way of Soussa or across country by Zanfour, brings the traveller to Kairouan, and a ride of about seventy miles from that holy city in a south-westerly direction enables him to reach the banks of the pretty stream that once skirted the walls of the ancient city of Sufetula. The modern name of Sbeitla is an Arab corruption, as that of Sbiba, some thirty miles further north, represents the original name of Sufes. Whether this word Sufes was associated in old times with *Suffetes*,—the two supreme magistrates who ruled over Carthage, and whose title bears a resemblance to the Hebrew *Shofetim*, mistranslated in the Bible, Judges,—is open to doubt. The history, however, of Sufetula is so intimately interwoven with the progress of Christianity in North Africa, and with the first disastrous encounter of a Christian population with the followers of Mahomet, that European as well as Arab historians have given it a special place in their records. Edrisi, the Arab geographer of the twelfth century, tells us that "Sobeitala was, before the Arab invasion, the town of Gerges (Gregory), King (prefect) of the Romans of Africa; it was remarkable for its extent as well as for the beauty of its situation, for its abundant water, for the mildness of its climate, and for its wealth; it was surrounded by orchards and gardens. The Musselmans conquered it during the first year of the Hegira, and put the great King Gerges to death." Other writers tell us that this Gerges, sometimes written Gregorius, had revolted from the Byzantine Empire, and had made himself ruler of the whole country from Tripoli to Tangiers, making Sufetula his capital. With the appearance of the Arabs in this remote corner of North Africa commenced the struggle for supremacy between the representatives of Christianity and the followers of Mahomet. The city, having no walls of defence, soon succumbed to the invader. Gregorius was slain, and the treasure of a numerous and wealthy population passed into the hands of the victorious army. With this calamity the records of Sufetula cease, and Christianity in Africa received a blow from which it never recovered.

The monumental remains are extensive, though it would be difficult to define the exact boundaries, owing to the absence of external walls. The lines of streets and the foundations of numerous buildings, both public and private, can be traced for nearly a mile in one direction, and somewhat less than half a mile in another. Its ruined edifices, many of them of noble proportions, bear ample testimony to the wealth and importance of Sufetula prior to the Arab invasion. The principal monument that has withstood the ravages of time and the neglect of more then twelve centuries, consists of a range of three temples, placed side by side and partly attached. They may be assigned to the



reign of Antoninus Pius, A.D. 138-161. The porticoes formed nearly the whole of one side of a large walled enclosure, measuring about 240 ft. square, to which access was obtained through a monumental gateway facing the temples. This gateway, in very fair preservation, is still standing. The back walls of the three temples formed the back of the enclosure, and behind them ran one of the main streets of the city. The central edifice is of larger proportions than the two that flanked it, and is of a more ornate character. Its order is Composite, the others being Corinthian. They are all tetrastyle and pseudo-peripteral. The cella of the middle temple has engaged columns at the sides and back, but the others have pilasters only. The back walls of the three temples, the entire cella of the central one and a greater part of the flank walls of the side ones are still standing. The porticoes are overthrown, but the bases of many of the columns are in position as well as the lines of steps. The broken monolith shafts, which were more than 30 ft. high, with their enriched capitals and huge fragments of sculptured ornament, lie piled up one on another in a majestic and imposing mass. The enclosure appears to have been paved with immense slabs of stone, which are still visible some 4 ft. below the present surface. Around it was a colonnade and, from the general appearance of the remains and the number of *frusta* of shafts of varying dimensions, it is reasonable to suppose that there were other shrines or votive monuments within the enclosure. The entrance, as already stated, was through a gateway of three arches, and within the gateway was a portico connecting the colonnades on either side. It was evidently intended that the entrance should face the central temple; but, for some unaccountable reason, it is fully 20 ft. to the west of the central line or axis of the enclosure. The custom of enclosing sacred edifices with walls of defence originated at some remote period when temples were used as depositories for the treasure of a city, as well as for affording shelter to women and children in times of invasion. At Carthage, for instance, the chief temple in the city, dedicated to Æsculapius, stood within the citadel. The Parthenon at Athens was within the walls of the Acropolis, and the temple of Jupiter in Rome was in the capitol. At Balbec also there is an enclosure commonly called the *Hieron*, bearing some resemblance, though on a larger scale, to this one at Sufetula.

The illustration is a restoration of the three temples and of a portion of the enclosure, being the result of actual measurement on the spot and of sketches of the details of the architecture. It is satisfactory to know that the Société des Monuments Historiques is keeping a watchful eye over these interesting remains as well as over the other ruined edifices and inscribed stones, and that in course of time our knowledge of this ancient city and of the important part it played in the spread of Christianity during the rule of the Byzantine Emperors may be largely extended.

The appearance of Sufetula, as it was in the fourth and fifth centuries, is easy to imagine. Situated on rising ground, at a point where the great highway from Carthage to the interior intersected the main road from Theveste seawards, its position was a commanding one. A fertile soil, forests of pine-trees, and a never-failing river of pure water that ran by the city walls, contributed to make Sufetula a place of delight for the wealthy colonists of North Africa. To-day it is a dreary, unpeopled spot, lying "remote, unfriended," in the midst of a trackless country. The waters are still there,—a perennial stream, pure as crystal, but the trees are gone, the plains are arid or clothed with rough herbage, and all signs of habitation have long since passed away. Yet, in spite of prevailing desolation, this spot, so far removed from human dwellings,—its ruined fanes outlined sharp against the sky, its weird stones standing ghost-like on the outstretched plain, the stillness of the air broken only by the babbling of the waters,—has much to charm the eye and quicken the imagination.

ALEX. GRAHAM, F.S.A."

HOUSE AT WRAYSBURY.

THIS house is being built near Egham Lock, from the designs of Mr. T. E. Collcutt, the materials employed being red brick, stone, and oak; the bricks are of special make, from the Cranleigh brick works, and work six courses to the foot in height. Mr. Messum, of Twickenham, is the builder.

The drawing is exhibited at the Royal Academy.

RETABLE FOR ST. ALBAN'S CHURCH, TEDDINGTON.

THIS retable, designed by Mr. A. H. Skipworth, will be executed in either Clunch or Ancaster stone, and will be partially coloured and gilded. Mr. L. A. Turner will carry out the work, the modelling of the angels being most probably entrusted to Mr. Dressler.

The drawing is exhibited at the Royal Academy.

REREDOS FOR GRAYINGHAM CHURCH, LINCOLNSHIRE.

THIS reredos is of oak, slightly stained and partially coloured, gilded, and silvered. The centre panel, in copper gilt, is the work of Mr. Conrad Dressler. The woodwork was executed by Mr. L. A. Turner, of Orde Hall-street, from the designs of the architect, Mr. A. H. Skipworth.

The drawing is exhibited at the Royal Academy.

WORKING MEN'S UNIONIST CLUB, AYR.

THIS club, which has been opened this week, is built from the designs of Messrs. Morris & Hunter. The large bay window in the end on the ground-floor forms part of the club reading-room; the three windows above light the anterooms attached to the hall, and the centre one opens on to the balcony as a convenience for open-air speeches when required. The half-timber gable above forms part of the club-master's residence.

There are three distinct exits with separate staircases from the hall. The club contains, besides the hall, a billiard-room, recreation-room, and reading-room. The hall will seat 600 people. The cost of the whole was limited to 2,500*l.*, hence the building has necessarily been kept plain and simple in its architecture.

ST. JUDE'S CHURCH, PRESTON.

THIS church is now approaching completion for the new parish of St. Jude's, Preston. The general character of the design is that of late Decorated Gothic. The walls are carried out with smooth-faced Yorkshire parpoints and Rainhill stone dressings, the interior dressings also being in Rainhill stone. The total accommodation is for 645 persons, and, in addition, there are chapels on the north and south sides of the chancel, which may be used for seating. The organ is placed in the gallery over the south chapel. The chancel floor is well raised, and choir vestries, &c., provided underneath. The clergy vestry is at the east end of the south chapel, and connected with the choir vestries by a passage and steps. The baptistery is at the west end, and the main porch and entrance at the north-west corner, with smaller entrances at the south-west corner and north-east end of north aisle. The design is by Mr. R. Knill Freeman, of Bolton and Manchester. The contractor for the whole of the work is Mr. Thomas Croft, of Preston; the sub-contractors being Messrs. Tullis (mason); Mr. W. White-

side (joiner); Messrs. Walmsley (plumbers and glaziers); Mr. Cook (plasterer and painter); and Messrs. Bradshaw & Son (slaters). The heating by hot water has been carried out by Mr. Seward; and the choir-stalls, &c., of oak, by Messrs. Bell & Copeland; all of Preston.

THE ARCHITECTURAL ASSOCIATION:

THE RELATION OF THE ARCHITECT TO THE WORKMAN.

IN the discussion which followed the reading of Mr. Ashbee's paper* on this subject,

Mr. H. O. Cresswell said he had great pleasure in proposing a vote of thanks to Mr. Ashbee for his paper, especially as he had attended twice there to read it. Considering that they in the Association had been discussing educational methods a good deal of late, it was very interesting to them to have a paper from what he might call an entirely fresh mind,—in other words, from a gentleman who had not been following the ways and work of the Association, but who looked upon the education of the architect from a somewhat different standpoint. Mr. Ashbee had introduced them to the workman's side of the question, and perhaps with advantage, for they were possibly a little too much inclined to look at it from the employer's or contractor's point of view alone. He did not know how they would get on with the communal system, and in general he was hardly prepared to follow some of the theories enunciated by Mr. Ashbee without having had the opportunity of reading the paper. He thought there was a great deal in it, but that it wanted more consideration before he felt able to discuss it with very much profit. He thought their sympathies were very much with Mr. Ashbee on the question of the desirability of young architects mixing with workmen, and seeing work in the workshops, and he hoped that the Association would be able to do something to bring its members more in contact with workmen. Probably the Guild and School of Handicraft might be able to give them some assistance in that direction. Mr. Ashbee had spoken against architects working too much upon paper. They had, he (the speaker) was afraid, been accustomed to think too much upon paper, and no doubt, if they could think with materials rather than on paper, they would be able to take a wider grasp of their work; but in dealing with buildings pure and simple, it was difficult to see how they could be dealt with on any other material than paper. If one was considering the planning and arrangement of a building, or if one had to make details of the masonry work of that building, he failed to see a better method of working them out than on paper, unless they adopted the mason's method of setting out the work on boards, which, after all, came to pretty much the same thing. He trusted that the members of the Association would have an opportunity of visiting the workshops of the Guild and School of Handicraft, where they might learn much that was useful.

Mr. Leonard Stokes said he should like to be allowed to second the vote of thanks, especially as it was partly his (the speaker's) own fault that Mr. Ashbee had to come there a second time. He thought they could not be too grateful to Mr. Ashbee for the lucid and somewhat new light in which he had put the whole question before them. As he had said, our modern life must of necessity have a great influence on modern architecture. A great deal of the work produced now was merely in supply of a demand for cheap grandeur, which became cheap vulgarity. The great idea of the present day was to make a show. Possibly that might be a fault of our social system, and it was for architects to endeavour to persuade their clients to be a little more reserved,—to accept designs for buildings which showed far greater reserve than much of the stuff which was now built. It was very difficult to persuade a client that a simple design was better than an elaborate one. The uneducated client thought that an elaborate thing was the best. Of course, the question of style came in. "Style" was an odious word, but if they went to work conscientiously he thought they could let style alone. So long as a building was a good one, it did not matter what the style was. As to what Mr. Ashbee said about young architects mixing with workmen, he (the speaker) thought that was a matter of great importance. It was very desirable that workmen should become more in touch with the architect and the designer. As matters were ordered at the present time, the workmen never, or hardly ever, got sight of the architect's drawings. The bricklayer was set to work in one place, the mason in another, and the carpenter in another, but they were all working in ignorance of each other's work, and had no idea of what the building would be like as a whole when finished. How could they, under such circumstances, be expected to take any very lively interest in their work? He thought it would be a very desirable, although a very simple, step in the right direction to allow the workmen to look at the drawings occasionally. Let them put it in the contract, if they liked, that the workmen should be allowed to look at the drawings once a week. Many of Mr. Ashbee's remarks, on such questions, for instance, as apprenticeship, and the possibility of architects being able to get at the labour market directly, without the intervention of the middleman, were of great interest. He thought it would be a great good if the architect could more often come into contact directly with the individual workman who was to carry out work from his designs. In conclusion, he desired to express the thanks of the meeting to Mr. Ashbee for having brought down so many interesting specimens of the Guild and School of Handicraft.

Mr. Sydney Vacher said he should like to say something on the opposite side of the question. If an architect could go direct to the trained workman, why could not the public? Why have an architect at all? As to the architect consulting the workman, he failed to see the advantage of it. Would they have the British sailor consulted about the handling of a man-of-war? Must not the architect, like the commander of a vessel, be the responsible head, and must not each of them be able to rely on implicit obedience to orders? Was it not the first duty of the architect to supply the best building he could for his client? While he could not assent to all the propositions laid down in Mr. Ashbee's paper, he (the speaker) was delighted to see the work of the Guild and School of Handicraft, because it was educating the workman; and if they could find a workman who had originality, they should give him a suggestion, and leave him to work it out. Of course, that method of procedure was not possible with regard to the whole work of every-day building. While it helped to educate the workman, it also helped to educate the architect, who naturally felt bound to keep in touch with what was going on. Above all, it helped to educate the public, and that was what was wanted more than anything else. It had been said that the present was an age of show, but every age had been an age of show. No doubt one evil of the present day was that we lived too fast; we were too fond of living beyond our means. Everyone was trying to obtain gorgeous show or smartness for a minimum of expenditure, and but few would pay for the real thing. That was the complaint everywhere. There was another thing which struck him, and that was whether, if these schools and guilds became very powerful, would not they be attacked by the modern unionism? Mr. Ashbee had said that apprenticeship was being killed by the modern subdivision of labour, but in his (the speaker's) opinion apprenticeship was being killed by modern unionism,—it was being killed by the enormous number of unskilled workmen who were driving down the standard of work to a dead level. One was constantly hearing of the difficulty of taking boys as apprentices by builders; the men struck against it. It seemed to him that the technical schools were now attempting to supply a real substitute for the workshop training of apprentices; and he thought that sooner or later the Government might have to take steps for the compulsory education of the craftsman. One suggestion he might make, arising out of the work of the Association, was this: that, if any members found themselves, as the result of their work in the classes, unlikely to succeed as architects, owing to inability to grasp theoretically, that was to say, on paper, either the artistic or the constructional part of the work,—perhaps both,—why should they not turn their attention to craftsmanship? Many men who now spent their lives as clerks or assistants would have a much finer position if they became craftsmen. By the Committee of such a school as Mr. Ashbee's, such men should be welcomed, and when successful, as they became known, many architects would be only too glad to employ them, giving to a craftsman in each trade a share of a building, just in the same manner as in Scotland the architect, instead of giving out his work to one contractor, gave it to many.

Mr. E. W. Mountford said he fully agreed with Mr. Ashbee that the interests of the work man and the interests of the architect were identical. He agreed, too, with the previous speaker that modern trades unionism had many faults, and that it did a great deal of harm in some respects; but in other respects it did a great deal of good. He believed that every step towards improving the wages of workmen and (up to a certain point) shortening their hours of labour was a step in the right direction. Those who had had the misfortune to work with builders, generally in a small way of business, who employed non-union men, to whom they paid less than the union rate of wages, knew, to their cost, that such men were, as a rule, utterly incapable of producing really good work. In his experience, men who got higher wages undoubtedly did a higher class of work than the men who got low wages, and it was always best to entrust building work to good firms of contractors who were known in the trade as paying the highest wages. Such firms retained a large staff of men who were capable of doing the best work. There was one point on which he could hardly agree with Mr. Ashbee, and that was when he said that an architect should do as little as possible on paper. It was no doubt desirable that the architect should be able to model a little, but he thought it was quite out of the question for an architect to become sufficiently conversant with the whole of the many trades concerned in building to be able to explain to the workman, in the material itself, how every detail of the work should be executed. To properly learn any one of the trades concerned in building was the work of almost a lifetime. Although an architect might, perhaps, learn to be a decent bricklayer in the course of a few years, he could not possibly expect to become a good mason unless he gave up many years to the work. But, of course, without being able to do the work himself, he ought to know how it should be done, and in order to give his instructions to the workmen, he was bound to have recourse to drawing-paper or tracing-paper. He cordially supported the vote of thanks to Mr. Ashbee for his paper.

The discussion was continued by Messrs. A. E. Bartlett and Sidney Tugwell; and the Chairman (Mr. F. T. Baggallay) having put the motion for a vote of thanks to Mr. Ashbee, which was carried very heartily, Mr. Ashbee replied to some points raised in the course of the discussion, and the meeting proceeded to consider the affairs of the Association, as reported in our last.

* Printed *in extenso* in last week's *Builder*. See pp. 437 *et seq.*

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—By permission of Messrs. R. Irvine and D. Harris, the Sketching Class of this Association will meet at Royston House, Carolina Park, Granton, at three o'clock on the afternoons of Saturdays June 11, June 25, July 2, and July 16, to make measured drawings and sketches of the south front of the mansion. The Class will be conducted by Mr. J. Watson and Mr. J. N. Scott.——The members of the Association had their annual excursion on the 4th inst. The destination this year was Drumlanrig Castle, in Nithsdale, permission having been obtained from the Duke of Buccleuch to inspect the building. A company of some thirty-five gentlemen proceeded by express train to Elvanfoot, and a drive was then commenced. A stop was made at the village of Durrisdeer, where the party were met by the Rev. Mr. M'Kenzie. The old manse was first inspected, and Mr. M'Kenzie explained that it was supposed to be of pre-Reformation date. The church proper only dates from 1699, and is a very plain building. In the tower there are the notable "Queensberry marbles," and these were viewed with much interest. The sculptor of these works is unknown, but they date from about the middle of last century. The vault below is the burial-place of the

Dukes of Queensberry. After lunch the party proceeded to Drumlanrig, the pink sandstone pile which occupies such a commanding position above the right bank of the Nith. Mr. John M'Lachlan, who acted as leader of the excursion, gave some account of the castle and its history. The builder, he said, of Drumlanrig Castle was William, first Duke of Queensberry, and the erecting, which began about 1680, lasted for over ten years. Regarding the building, the arrangement was simple and dignified. It consisted of a great square, 146 ft. by 120 ft. externally, with an inside space of 77 ft. by 57 ft. The double circular staircase to the front entrance was comparatively new, but a similar staircase formed part of the original design. The hollow square of the building had four staircases leading to the various flats, an arrangement somewhat similar to those of Linlithgow Palace, Caroline Park, and Heriot's Hospital. The architect of the building was unknown. The company subsequently went over the house and afterwards drove through the Drumlanrig woods and along the banks of the Nith. From Mennock Bridge the drive was continued up the Mennock Water to Wanlockhead and on to Leadhills, where the party dined.

GLASGOW ARCHITECTURAL ASSOCIATION.—The opening meeting of the season (1892-3) was held on Tuesday evening in the N.B. Station Hotel, George-square, the hon. President in the chair. Mr. Alexander McGibbon delivered his Presidential address, the subject being "Current Architectural Criticism." A few remarks by the hon. members present concluded the business meeting. The meeting then resolved itself into a smoking concert, during which Mr. Alexander McGibbon was presented with a handsome old Dutch cabinet and set of silver plate from the past and present members of the Association, as a mark of their esteem of his long and faithful services as secretary. Mr. W. I. Anderson made the presentation on behalf of the members.

BRITISH ARCHÆOLOGICAL ASSOCIATION

AT the meeting of this Association on June 1, Mr. J. W. Grover, F.S.A., in the chair, Mr. Barrett exhibited several sketches of various armorial bearings of old members of the Trinity House, and read an elaborate paper on the history of the Company, the materials for which he had obtained from various State papers, the archives of the Company having been burnt in 1714. The lost history thus recovered referred to many curious points of sixteenth and seventeenth century history, including the establishing of lighthouses along the coast of England, the Company having a patent for doing so. The origin was from a fifteenth-century guild, which was incorporated in 1573. The Company's arms were those of Sir T. Sport, the first Master, who died in 1541, and who is buried in Stepney Church. Enormous sums were spent by the Company in helping to man the fleet in times of national peril, details of which were rendered. In addition, many particulars were given of the Company's work in freeing captives from the Barbary corsairs, whose ravages round the coasts of England and Ireland is no creditable page of English history. Mr. Loftus Brock, F.S.A., exhibited some curious examples of neatly-turned alabaster found on the site of Cyzacus, of Greek workmanship. The chairman described several remarkable flint implements, of prehistoric date, one of which, found by him at Stonehenge, was carbonated and white from long exposure. Mr. Earle Way exhibited several examples of bellarmine jugs found at Southwark, including some of earlier date than the middle of the sixteenth century. Mr. Barrett exhibited a very fine Grès de Flandres jug, dated 1691. A second paper by Mr. Macmichael was then read, entitled "The Greybeard." The author traced the origin of this once common brown ware jug from early times, and produced several examples, which showed the progress of the form to its full development, when, by the addition of the head and broad, square-cut beard, the shape was supposed to resemble the portly form of the obnoxious Cardinal. These vessels were made in very large quantities in almost every town of the Low Countries, and imported into England. A collection of the designs of the cartouches which decorate the sides were exhibited. These show, in almost every case, the arms of the various cities of manufacture.

Correspondence.

To the Editor of THE BUILDER.

ELECTION OF FELLOWS, R.I.B.A.

SIR,—It is proposed to alter the present system, and dispense with the ballot.

I beg to suggest as an alternative that the existing system be retained, with the provision, however, that in the event of any candidate being blackballed, he shall have the option of a further chance with voting-papers, but only upon his own requisition.

The cost of the voting-papers and postage, addressing, &c., would in an isolated case be not much less than 10*l.*

A proposition has been made that the elections shall be by show of hands (unless three members should demand that voting-papers be issued).

In either case I think the cost of the voting-papers, &c., should be paid by the candidate only when unsuccessful.

"SUUM CUIQUE."

June 6, 1892.

HORNSEY MAIN ROADS ARBITRATION.

SIR,—It would no doubt prevent a good deal of misunderstanding, as well as needless litigation and expense in the future, if you would allow me, as the Chairman of the Highways Committee of the Middlesex County Council, to supplement the paragraph which appeared in the *Builder* under the above heading [p. 447, *ante*], by stating that the Hornsey Local Board claimed 4,098*l.* 18s. 4d., the total amount expended by them for the maintenance of about two miles and three-quarters of main roads for one year; the award of the Local Government Board was, as mentioned, 3,221*l.* 5s. The important fact, however, is omitted, that the award is 877*l.* 13s. 4d. less than the amount claimed by the Local Board.

Without this explanation, local authorities throughout the country are likely to form a most erroneous judgment with reference to this case. H. R. WILLIAMS.

6, *Lime-street, E.C.*, June 8, 1892.

"A QUESTION OF BUILDING PENALTY."

SIR,—The letter under the above heading in last week's *Builder* should be carefully noted by all contractors, and replying to this we should say "A Contractor" had better refer to the contract he entered into, for from recent experience in a somewhat similar case, in which we were mulcted in a loss, we found that everything depended on this.

In our case delay was caused—1. By the carpenters' strike. 2. By additional work. 3. By our being unable to proceed for want of details and instructions.

The contract we had entered into allowed extra time for delay caused by "general lockouts," "strikes," or from any cause whatever which in the opinion of the architect was beyond the control of the contractor."

Now, this looked all right on the surface, but the fact was, the architect was brother to the employer, and we found to our cost that it was not a question of strikes, lockouts, or other cause whatever, but the opinion of the architect; and, having to choose between an action for fraud on the ground that the certificate was given contrary to facts,—and a loss,—we were advised not to throw good money after bad.

The lesson we have learned from this is, not to put ourselves into the hands of any one man or firm; and we think the conditions agreed on between the Royal Institute of British Architects and the master builders of London are to prevent unfairness on either side, and that builders should not sign any other. OTHER CONTRACTORS.

SIR,—In answer to your correspondent on p. 444 *ante*, I consider that the penalties in his case cannot be enforced, but before anybody could definitely decide all the points raised the whole of the documents should be inspected.

On the one question of the errors in the quantities it is necessary to know whether they were prepared by the architect or by an independent surveyor, and whether paid for by the builder or by the employers.

HENRY LOVEGROVE.

26, *Budge-row, E.C.*, June 8, 1892.

FOURTEENTH AND FIFTEENTH CENTURY SCREENS.

SIR,—I shall be much obliged to any reader of the *Builder* who will inform me where I can see good specimens of church screens of the fourteenth or early fifteenth centuries.

B. RUCK-KEENE.

Copford Rectory, Colchester.

The Student's Column.

WARMING BUILDINGS BY HOT WATER.

XXIV.

EXAMPLES OF BUILDING WORKS.—*Continued.*

THE next example that may be suggested, is as fig 97. This is an apparatus extending away from the boiler in two different directions, for the purpose of heating two rooms of different size and in different manner. Taking the boiler first, this is shown having two flow pipes off the top, and each flow has a stop valve near the boiler, as shown.

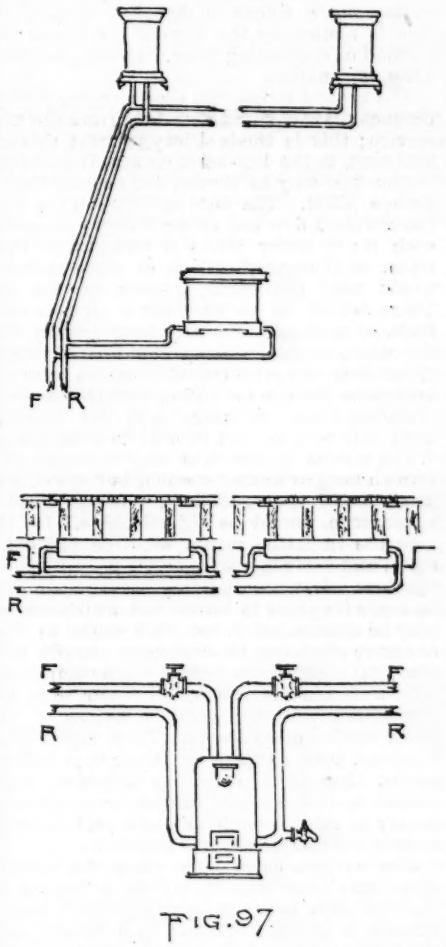


FIG. 97

When it is convenient to have two flow pipes in this manner, it is as well to use them, although one flow, which is immediately branched in two directions, has no bad features; in this latter case the single pipe should be a size larger. In an apparatus such as this, especially as it does not appear to be extending far in height, the main or general services should be 1¼ in.; 1 in. might do in some cases, but is not recommended. The returns are usually brought right back to the boiler, although there would be no objection to their being branched into one, if they met at some distance from the boiler (this is not the case in the example given). If the two services terminate in a single return, it would be well to have this of a size larger pipe, as suggested with a single flow. An emptying cock and cleaning plugs must be provided to the boiler, and when placing the boiler there must be room enough in front of it for the cleaning and stoking tools to be used.

Each flow-pipe should have a stop-valve in it, so as to regulate the heat in either direction as occasion may require, and also to check the possible inclination one service may have to work more freely than the other. Hitherto we have suggested giving the longest service a greater rise (if possible) so as to equalise results, and this may be done in this case if convenient, but stop-cocks must be provided as well. We cannot suppose that both rooms want to be heated at the same time and to the same extent always, and on this account alone the stop-cocks are needed.

The service shown as proceeding to the left, goes to heat a large room, requiring three radiators,—a billiard-room, for instance. Speaking of billiard-rooms, let the reader be cautioned against putting pipes or coils under the billiard-table, nothing more improper could be done. If the pipes in question are sufficient to heat the

room, they will pull the table to pieces. The writer was once consulted respecting a billiard-room that some one had attempted to heat by a single radiator placed under the table. Fortunately for the table, the radiator was not a large one, it failed to heat the room and did no injury; but even with this insufficient heat the players complained of the heated air ascending from under the table, and coming directly to the face when in the act of resting on the board to play. No heating appliances should be under a billiard-table.

The illustration is intended to show the radiators placed around the room, in corners, or at most convenient points. They must not, however, be too near wainscotted or similar woodwork, or the heat will injure it. The radiators are shown of different shapes, but this is settled by the general conditions; the method of connecting them, however, requires a little explanation.

The nearest radiator is shown connected by a distinct branch flow and return from the main service; this is the best way to treat this one. The next, in the left-hand corner, is connected to the flow only as shown, and as described in Article XXII. The last radiator on the right has the main flow and return directly connected with it; it really forms a terminal to these pipes, as illustrated. Each of these radiators would need the usual air-cock on the top. There would be no need for a stop-valve to each, as although one may heat quicker than the other, the whole three would soon become of an even temperature. The mains with this apparatus should be 1¼ in., but the pipes or branches from the mains into the radiators need only be 1 in., or ¾ in. will do sometimes.

The service to the right may be supposed to furnish heat to a smaller room, but one of such a character that radiators, however good in appearance, would be objectionable. In this case the radiating media must be put out of sight, and this example shows it placed beneath the floor. In a new building, arrangements can be made for pipes to be carried whichever way may be most suitable, but such works as these are more often put in residences already occupied, but which have certain rooms that should have a regular heat, or which the ordinary fireplaces are not successful in heating. This latter trouble often occurs. There are numbers of rooms, even as large or larger than billiard-rooms, that have only one fireplace, which cannot heat the whole of the room, although it may be large enough to cause an intolerable heat at the end where it is situated.

The writer's usual plan when the heating-pipes have to be beneath a floor is first to see that the room below is an unimportant one,—a kitchen or servants' offices; then to cut away the plaster of the ceiling, and secure an ordinary pipe-coil with box ends up to the joists. Immediately above the coil, on the top side of the joists, a suitable sized hole is cut in the floor-boards, and a brass grating laid in. The pattern of the grating should be open, yet strong enough to bear being stood upon. Branch flow and return pipes enter the box ends of the coils as shown, but, with coils lying flat, it is best to let the flow-pipe enter at a point as far removed from the return as possible, so as to ensure the passage of hot water through all the pipes. (It is not as if the coils stood upright, when it is recommended to connect all pipes at the bottom only, as the heated water then readily finds its way through the top pipes without any special provision).

Thus far the arrangement is sufficient to heat the room, as although the coils are on the ceiling of the room below, all the heat would come up through the joists and gratings, but there are two things further to consider. First, the coils would have an exceedingly bad appearance below, and secondly, and most important, all the impure air and possible odours (if a kitchen) will come through with the most undesirable speed imaginable. The coils must be boxed in below, this will totally hide them and will make the ceiling sound, and, when whitened, of ordinary appearance except for the square box projections that must exist. To do away with these boxes the joists would have to be cut through and trimmed to make a space for the coil; this would be a somewhat expensive and troublesome undertaking. Notwithstanding the box below, which quite shuts off communication between the room above and below, the spaces between the joists should be soundly stopped also, or air may be drawn this way from disagreeable sources. When this is done, the coil will heat the air of the room only, it will be practically a coil in a box, or well, sunk in the floor, but, if convenient or desirable, a fresh-air conduit could be led to it from outside. There would be then a rapid inflow of

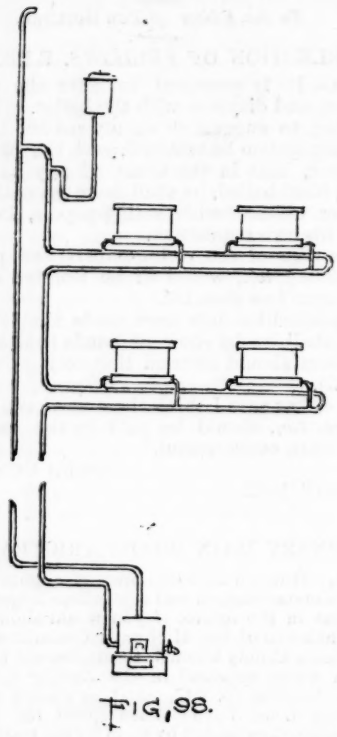


FIG. 98.

air, warmed by contact with the coil, and an inlet of this kind always goes to reduce the disagreeable draughts at doors and windows.

Air-cocks would have to be put upon the highest points of the coils, and when requiring attention could be got at by removing the gratings. If this is inconvenient, small tubes can be carried from the same points, but either up or down, whichever is best, and terminating with cocks.

With an apparatus like this, an expansion pipe should be provided; ¾ in. would do, and the proper point for it to start from, would be in the flow-pipe somewhere between the two stop-cocks. The cold supply would be provided for by a good-sized cistern fixed at any point from 1 ft. to 4 ft. above the top of the highest radiator. The supply-pipe might be led into any of the return-pipes with the necessary dip or syphon.

Doubtless many of our readers have heard that it is proper in some instances to connect all radiating pipes, coils, &c., to the main return service only. This is correct in some cases, but in none of the examples yet given is it necessary or desirable. The methods shown are as good as any. The idea of putting all radiating media on the main return, arises from the argument that the service-pipe which has the greatest weight of water in it, or connected with it, should be the one that has the water

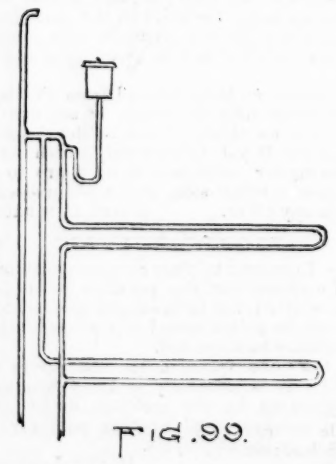


FIG. 99.

descending within it when at work. In other words, if the flow-pipe had a greater bulk of water in connection with it than the return, it would tend to be an obstacle to the upward direction of the water when it goes to rise up this pipe, and having a greater amount of water to displace than there is in the return-pipe, it might bring about a reversed or retrograde circulation.

This theory is broken down a great deal now, yet, at the same time, when an apparatus extends in a vertical direction a good height, and the engineer has any fear of such a result, he may put his coils all on the return, as fig. 98 for instance. This shows an apparatus with a boiler in the basement, but going to heat two corridors or rooms a floor or two above. If it was feared the upper coils (or pipes) would give better results than the lower, then the circulation to each could be equalised by running the services as in fig. 99. If it is not desired to make the connexions wholly with the

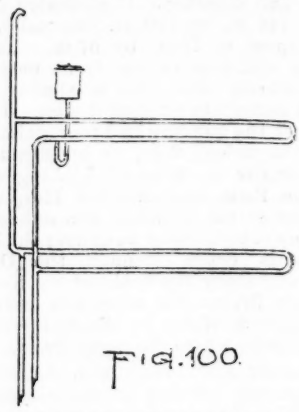


FIG. 100.

return pipe, then it could be carried out as in fig. 100, which is, perhaps, the most customary way of doing it now.

GENERAL BUILDING NEWS.

ENLARGEMENT OF TULLIE HOUSE, CARLISLE.—On the 26th ult. the Mayor of Carlisle laid the foundation-stone of the enlargement of Tullie House, Carlisle. Tullie House, which dates from the end of the seventeenth century, is situate in Abbey-street, and will be used as a museum, and a new wing will be built at right angles with Abbey-street, to include rooms for the School of Art, the Public Library, with lending and reference departments, a general reading-room, a boys' reading-room, class-rooms for technical instruction, and a Fine Art Gallery. It is estimated that the cost will be 12,000*l*. The scheme was devised by Mr. C. J. Ferguson, who prepared sketches embodying his suggestions, and Mr. Howard Smith, the City Surveyor, prepared the detailed drawings. Upon the basement of the new building will be a boys' reading-room. On the ground floor will be the Public Library, class-rooms for technical instruction, and a lecture theatre to seat 200 students. Upstairs will be the School of Art, with its various elementary and advanced class-rooms, painting studio, and picture galleries. The chief contracts have been taken by Messrs. J. & W. Baty, for bricklayer's and mason's work; Mr. H. Court, carpentry and joinery; and Messrs. R. M. Ormerod & Sons, fireproof flooring. Mr. Howell is clerk of works. We published in the *Builder* of May 9, 1891, some drawings of Tullie House as proposed to be adapted for a free library and school of art, which were furnished to us by Mr. Ferguson.—After the foundation-stone of the enlargement of Tullie House was laid, the Mayor's-drive on the boulevards round the Sauceries was inaugurated, and the new Recreation-ground in Botchergate was dedicated to the public. The Mayor's-drive was commenced from plans prepared by Mr. McKie, the then City Surveyor, and has been finished by his successor, Mr. Howard Smith. It is a roadway formed from Eden Bridge round the Sauceries. It is about 1,200 yards in length, and along both sides of it are planted trees. There is a project for continuing the "Drive" round the Sheep Mount, and if this is carried out a bridge will be built across the river Caldew, a short distance above its confluence with the Eden. The new recreation-ground is off Fusehill-street, and is over an acre in extent.

PUBLIC BATHS, SALFORD.—On the 2nd inst., the Mayor of Salford (Mr. Alderman Keevney) opened the public baths recently erected by the Salford Corporation in Regent-road. The baths are situated at the corner of Regent-road and Derby-street, and have been erected from designs prepared by Messrs. Mangnall & Littlewoods, architects, of Manchester. The design is Renaissance in character, the material for the elevation being red terra-cotta and the best pressed bricks from Ruabon. The principal entrances are in Derby-street, the manager's residence over them forming a central feature to the elevation in that street. The first-class entrance is at the right-hand doorway, which leads to the first-class swimming-bath, the first-class gentlemen's slipper-baths, and the ladies' slipper-baths. The left-hand entrance is for the second-class bathers, and leads to the second-class swimming-baths and second-class men's slipper-baths. The first-class embraces vapour-baths, cooling-rooms, and shower-baths. The bath-rooms are 8 ft. by 6 ft. 6 in. There are ten first-class slipper-baths and eighteen second-class for

gentlemen. The ladies are provided with four first-class slipper-baths and eight second-class. The first-class swimming-bath has a water area of 58 ft. by 25 ft. The second-class swimming-bath has a water area of 75 ft. by 28 ft., the depth being 5 ft. 9 in. at the deep end, and 5 ft. at the shallow end in each case. The contractors were Messrs. Robert Neill & Sons, of Strangeways, and the total cost of the buildings is about 11,000*l.*

BOARD SCHOOL, EDINBURGH. — On the 3rd inst., a new school for the Edinburgh School Board was formally opened by Lord Reay. The school is situated at Sciennes-place, and is the largest and most completely equipped of the schools erected by the Board. The total cost of the buildings was stated by the convener of the Building Committee to be about 21,626*l.*, and he claimed that in all its arrangements and equipment the Board had by no means neglected economy while securing the greatest efficiency. The accommodation of the school, including all the class-rooms and the lecture-room, he explained, was calculated at 10 square ft. for juveniles and 8 square ft. for infants, and amounted to 1,682 places; but, including the swimming-bath and gymnasium, the total accommodation was 1,985. Taking the total accommodation as for 1,985 children, the cost per scholar was barely 10*l.* 17*s.* 11*d.* The building was designed by and carried out under the superintendence of Mr. Robert Wilson, the architect for the School Board. (We take the foregoing particulars from the *Scotsman*).

MEMORIAL CHURCH, SUNDERLAND.—On the 18th ult. the Bishop of Durham (Dr. Westcott) laid the foundation-stone of St. Hilda's Church, Sunderland, which is being built as a memorial to the late Bishop Lightfoot. The church will be situated near the junction of Westbourne-road and Clanny-street, Millfield. It will be erected at an estimated cost of 5,072*l.* The nave will be 62 ft. 6 in. long, by 21 ft. wide, and, in addition, there will be two side aisles, two transepts, and a baptistry. Twelve pillars will be erected in the interior of the building, the majority of them being subscribed for by various local societies. The glass for three lancet windows at the east of the church has been presented by the Misses Halcro, of Sunderland. The church will be surmounted by a spire, rising to a height of 134 ft. from the level of the ground. Accommodation will be provided for 505 persons, and there is to be a morning chapel running along the east of the south transept. The architects are Messrs. Hicks & Charlewood, Newcastle-on-Tyne.

GIRLS' HOME, BALLYSILLAN, BELFAST. — The opening of the Victoria Voluntary Homes for the Shamrock Lodge Girls at Ballysillan took place on the 19th ult. The new buildings are approached from the Crumlin- and Oldpark-roads. The entrance lodge is situated on the Ballysillan-road. The main buildings are arranged in a hollow square. In the middle of the front is placed a square tower, finished with a pyramidal roof and copper vane. The principal doorway is placed below. From the inner porch access is obtained on either side to the principal schoolrooms. The west wing contains practically a distinct house, with the board-room, parlour, kitchen, and pantries on the ground floor. A corresponding wing on the south side for the industrial school department is arranged for 40 children. Behind it stands the hospital, complete in itself, having separate kitchen, scullery, and yard. The upper stories of all these buildings form a series of dormitories, with bath-room and lavatories attached. The rear of the entire block is occupied by the laundry, smoothing and drying rooms, heated from the boiler-room adjoining. A dairy and general storehouses complete these offices. A small engine with a pump attached, is used for forcing up the water supply to a cistern placed in the tower. At a short distance from the central building stands the Forster Green Home. It is so planned as to be complete in itself, and accommodates thirty girls. On the ground floor access is obtained through a porch and hall, from which open the dining-room, mothers' room, and the playroom. A bath-room, with lavatories, is attached to the last-named. Behind these are the kitchen, scullery, pantries, and yard. The upper floor is used for dormitories. A play-shed is arranged for use in wet weather. The buildings have been carried out in red brick, with Dumfries mullions and sills. The plumbing has been executed by Mr. John Dowling. Mr. Robert Corry, Donegall Pass, has carried out the works, and Messrs. Young & Mackenzie, of Belfast, are the architects.

FOREIGN AND COLONIAL.

FRANCE.—At the Champs Elysées Salon this year nothing in the sculpture or architectural exhibits has been deemed worthy of the *grande médaille d'honneur*. On the other hand, in the section of painting, after three tours of inspection, the award has been bestowed on M. Albert Maignan, by 163 votes out of 324. The other awards have been distributed between MM. Vayson, Roybet, Henner, Benjamin Constant, Raphäel Collin, and Henri Martin. M. Maignan, who has exhibited an Apotheosis of Carpeaux, is a pupil of M. Luminais. He obtained a medal of the third class in 1874, one of the second in 1876, a first-class in 1879, and a gold medal at the Universal Exhibition in 1889. He was decorated in 1883.——In architecture MM. Cordonnier and Charles Normand have obtained medals of the first class; MM. Chédanne, Lafargue, Hannotin, and Gaida the second; MM. Tissandier, Nizet, Tropey-Bailly, Boussac, Loyau, and Escalier the third: honourable mention has been awarded to MM. Bévière, Bobin, Coulon, Dalmas, Desnues, Dezermeaux, Giroix, Guénot, Guyon, Legendre, Lépouzé, Mauber, Mougenot, and Paul Normand.——At the École des Beaux Arts the Fortin d'Ivry prize has been given to M. Bonis. ——Several fires due to malevolence have destroyed a great quantity of wood in the most picturesque part of the forest of Fontainebleau.——In the Georges Petit Gallery an exhibition of 100 pictures has just been opened for a charitable object. They are works chosen from the most celebrated masters, from the time of Rubens and Rembrandt to Meissonier, Millet, and Corot. This exhibition is organised under the presidency of the Duc d'Aumale. —— They have lately inaugurated a statue of Pascal Duprat, at Mont de Marsan (Landes). The statue is the work of M. Labatut. ——Etienne Arago, recently dead, has left as a legacy to the museum at Versailles, two busts in terra-cotta, by Carrier-Belluse, of the astronomers Mathieu and Paul Langier. —— M. Waldeck Rousseau has offered to the Luxembourg Museum a picture by M. Gervex, which was exhibited in the Salon of 1885, entitled "Meeting of the Jury of Painting."——MM. Français, Bonnat, Jules Breton, Daumet, and Roty have been appointed to represent the Académie des Beaux-Arts at the ceremony of inaugurating the monument of Claude Lorraine at Nancy.——An exhibition of the works of the painter Antoine Richard is to be opened on the 15th inst. at Châlon-sur-Saône.——It is announced that, on the occasion of the approaching visit of the President to Nancy, the corporation of sculptors of that town will offer to M. Carnot an armchair richly carved in walnut-wood and covered with a fine tapestry in which the arms of Lorraine are woven. This work has been executed by M. Donot, sculptor.——The death is announced of M. Frederic Groselande, portrait painter. He was born at Geneva, but had been naturalised many years. He exhibited at the Salons annually from 1872 to 1888 studies of heads and portraits in pastels, executed with a certain amount of talent.——The sculptor Bonnassieux, member of the Institute, one of the oldest professors at the Ecole des Beaux-Arts, has lately died at the age of 81. He was born at Panissière (Loire), in 1810, and obtained the Prix de Rome in 1836. He then obtained a second medal in 1862, a first in 1864, a second in 1868, and a new first medal at the Universal Exhibition of 1855, at which time he was decorated. His well-known religious views made him the official sculptor of the Catholic clergy, and it is to him that we owe the colossal statue of Notre Dame de France, which commands the Vallée du Puy (Haute Loire); it was made from the bronze of the cannons taken at Sebastopol. He also assisted at the decoration of several of the Paris churches, notably that of St. Augustin. He has contributed nothing to the Salons for some time.——We have also to announce the death of the painter Jaumot, who died at Lyons at the age of 78. He received medals in 1849 and 1859.

BERLIN.—Herr von Forckenbeck, who has been Lord Mayor since 1878, died last week. His funeral was one of great civic state. During the fourteen years he held office, Berlin has seen a marvellous development, and also great improvements in all matters relating to municipal management.——The value of the prizes to be offered for the coming competition for designs of the proposed Provincial Museum has had to be raised from 250*l.* to 400*l.*, owing to dissatisfaction expressed in architectural circles as to the low figure of the premiums.——Some very interesting buildings for the Army Commissariat Department have been completed. In the main block there will be room to store 70,000 cwt. of oats. Owing to the great losses the forage departments have lately had through fires in their store-houses, great precautions have been taken against the outbreak and spread of a conflagration. Each of the seven stories of the main building is divided into two separate risks, and each compartment has a separate system of sprinklers. It appears, however, that for some inexplicable reason wood has been used for all the floors.——On the recommendation of the sanitary inspectors the Police President will probably now prohibit ladies from kindly acting as voluntary street scavengers. There is to be a restriction as to the length of ladies' trains.——The historical Castle Church at Wittenberg, the restoration of which has cost some 45,000*l.*, will be reopened by the Emperor in the autumn. Professor F. Adler has had charge of the works.

MUNICH.—The International Art Exhibition, which has now become an annual institution, has been opened by the Prince Regent with the usual ceremony. The local press considers this year's show to be a good one.——The buildings for the Bavarian National Museum, which are to be erected on a fine site near the so-called "English Garden," will cover a superficial area of some 8,600 square mètres. The new block is to cost about 220,000*l.*, and some five years will have to elapse until the halls will be ready for the reception of the exhibits (*Deutsche Bauzeitung*).

STUTTGART. — Again a competition has been opened with a great philanthropic object in view. This time it is a competition for designs of some large buildings, in which 400 or 500 railway servants and their families are to dwell. Each tenement,—consisting of two rooms, a kitchen, w.c., lobby, and a share of the staircase landing,—is to have an area ranging from 75 to 80 square mètres; those with three rooms from 90 to 95 square mètres. Much importance will be attached to the laying out of the ground which stands at the disposal of the authorities, as, besides the dwelling-houses, there are to be general washhouses, baths, stores, and a preparatory school to be found room for. The competition excites much interest throughout those parts of Germany where the artisans' dwellings question has been mooted.

SWITZERLAND.—Whilst at the past competitions for designs of new post-office buildings in Geneva and Lucerne the number of designs sent in was large, the assessors who have had to decide on the merits of the work tendered at the Zurich Post-office competition have only had twenty-seven to select from. They have not found any one of the twenty-seven deserving of the first prize, and have only been able to give five minor awards. The most valuable of these went to M. Eugen Meyer, a Swiss architect resident in Paris.

MISCELLANEOUS.

CHRIST CHURCH CATHEDRAL, OXFORD.—We are informed that the grave marked as Dr. Pusey's grave in our plan of Christ Church last week, in the external angle of choir and south transept, is in reality that of Philip Pusey, a son of Dr. Pusey. The latter was buried in the nave of the Cathedral.

FORTHCOMING SALES.—At the Mart, on the 21st instant, by order of the late Mr. W. B. Waterlow's trustees, various residential and building estates in the neighbourhood of Reigate and Redhill, comprising those known as High Trees, on the west side of Redhill Common,—the house built of stone, in the Italian mode, for its late owner,—and, with frontages to the Common, Fairlawn, The Mount, Blackstones, and Earlswood Cottage; together with High Trees Park, and other lands adjacent. In July: The Barwhillanty estate, of nearly 4,000 acres in the stewartry of Kirkcudbright, Galloway, and situated in the parishes of Parton and Crossmichael. The latter parish lies between the rivers Urr and Dee, to the north-west is Parton — a district famous for its Celtic and Pictish remains. At Carlisle, on an early date, the Springkell estate, in county Dumfries, just across the border, and about ten miles distant from Carlisle. It embraces an area of 14,000 acres, divided amongst fifty-one farms, yielding an annual rental of, say, 11,000*l.* The mansion house, built, we believe, about 100 years ago, for Sir William Maxwell, stands on the famed Kirtle water, which flows for some miles between Eskdale and Annandale. Gretna, or rather Graitney (*olim* Meg's-hill) is a farmstead, near to Springfield, a village established by Sir William Maxwell. One of the first inhabitants of that new settlement was Joseph Paisley, a tobacconist, — often wrongly described as having been a blacksmith,—whose memory is associated with the "Gretna Green" marriages since the passing of Lord Hardwicke's Act in 1754. Paisley died in 1814: his business, after that kind, was carried on here by his granddaughter's husband.

PATENT OFFICE REPORT FOR 1891.—According to the Comptroller-General's ninth report, for the year 1891, the general business of the Patent Office was represented by applications for 22,888 patents, being the highest total since the new procedure under the Act of 1883; designs, 21,950 (22,553);* and trade marks, 10,787 (10,258). Of the patents, 15,484 came from persons residing in England and Wales, 1,177 from Scotland, 134 from Canada, 1,466 from Germany, and 2,364 from the United States. Sales of the Office publications yielded a receipt of 6,142*l.* 13*s.* 7*d.*, and a surplus of 100,339*l.* 6*s.* 7*d.* is declared out of gross receipts amounting to 203,520*l.*, the patent fees alone being 181,777*l.* 4*s.* 8*d.* The largest number of patents applied for under the old law was 6,241, in the year 1882, and of them two-thirds remained in force to the end of the fourth year. The ratio for the year 1890, under the new Act, is a little less than one-half. In virtue of a Royal charter dated August 11, 1891, the Institute of Patent Agents was incorporated; it had a total number of 236 names upon the register of agents on December 31 last. For the re-building of the Patent Office, as already begun in Took's-court, a sum of 21,703*l.* is taken on account in the estimates, for new works and purchase of premises.

SWEDEN AND THE CHICAGO EXHIBITION. — The Swedish Society of Engineers in New York is urging Swedish manufacturers to participate in the Chicago Exhibition, and has, to that end, offered a prize for the best essay, "Ought Sweden to Exhibit in Chicago," which is to be distributed in Sweden and America.

* The corresponding figures for the preceding year are enclosed within brackets.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Public Baths	Walsall Corp.	50*l.* 30*l.* & 20*l.*	July 16
*Schools	Norwich Sch. Bd.	50*l.* 25*l.*	July 26
*Local Board Offices, &c. &c.	Bexhill Loc. Bd.	50*l.*	Sept. 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Sixty Cottages, Aberdare Junction	Carne Town Cottage Co. Limited	.....	June 14
*Six New Water Vans	Boro' of West Ham	L. Angell	do.
*Coal Stage, &c. Skipton	Midland Railway Co.	*Official*	June 16
*Cleansing and Painting Goods Depot, Bristol	do.	do.	do.
*External Repairs to Workhouse	St. Saviour's Union	Jarvis & Son	do.
Workshop, &c. Blackfriars-road, Elgin, N.B.	.....	J. Jamieson	do.
Additions and Alterations to Church, Stanwix, Carlisle	.....	C. J. Ferguson	do.
Twenty Houses, Tredegar Junction	Tredegar Junction Building Club	W. Edwards	do.
Widening of Bridge, Botcherby, near Carlisle	Cumberland C. C.	G. J. Bell	June 17
Long Boundary Wall, &c.	Halifax Corporation	E. R. S. Escott	June 18
Cottages, &c. Barrows Green, near Widnes	J. W. Wareing	.....	do.
*Stonework, Town Hall	Bermondsey Vestry	*Official*	June 20
*Repairs, Painting, &c. Relief Offices, &c.	St. Marylebone Guar.	do.	do.
*Shaft Sinking, Tunnelling, &c.	Manchester Corporation Waterworks	G. H. Hill	do.
Memorial Hall and Assembly Rooms, Llandovery	C. P. Lewis	.....	do.
*Guernsey Granite, Gravel, and Flint	Borough of Croydon	W. Powell	June 21
Villa, Nairn, N.B.	J. B. Leslie	C. C. Doig	do.
*Concrete Pavement in situ	East Ham Local Bd.	W. H. Savage	do.
*Brickwork, Erection of Chimney Shaft	Manchester Corporation Waterworks	*Official*	June 22
Abbatoirs, Cattle Sheds, Houses, &c North Dean	Halifax Industrial Soc. Lim.	Horsfall & Williams	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered
Two Cottages, Penrose Farm, Sennen, Cornwall	Henry Laity	.....	June 22
Heating Arrangements, &c. Hospital, Easington	.....	Lamb, Armstrong, & Knowles	do.
Street Improvements	Ystradyfodwg Loc. Bd.	J. W. Jones	do.
*Making-up and Paving Streets	Fulham Vestry	W. Sykes	do.
Dwelling-house, Moorville, Cumberland	John Elliott	.....	June 25
*Hire of Steam Roller	West Sussex C. C.	*Official*	June 27
*Rebuilding Broadbourne Bridge, &c.	do.	do.	do.
*Painting Works, Infirmary	Fulham Union	do.	June 30
*Rebuilding Ystrad Bridge	Breconshire C. C.	do.	July 2
*School Premises, New Swindon	The Committee	W. Whincop	No date.
*Green English Oak, Elm, and Ash	London Road Car Co. Ltd.	*Official*	do.
Biscuit Factory and Warehouse, Cardiff	Spillers & Bakers, Ltd.	Veall & Sant	do.
Schools, Knutsford	Lord Egerton of Tatton	Preston & Vaughan	do.
New Church of St. John, Crewe	.....	Hicks & Charlewood	do.
Farm Buildings, Cwm Cerwyn, near Maestec, S. Wales	Edward Knox	.....	do.
New Church, Horrabridge, Devon	.....	G. H. F. Prynne	do.
Sinking and Walling Shaft, near Wakefield	Hemsworth Colliery Co.	.....	do.
Engine House and Seatings	do.	.....	do.
Shops, Westbar, Sheffield	R. S. Whitworth	W. H. Lancashire	do.
Club Premises	Walkley Conservative Club	.....	do.
*Painting Works, Kingston and Tower of London	War Department	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Surveyor	Bermondsey Vestry	250*l.* &c.	June 15
*Foremen of Works (3), Lagos	Crown Agents for Colonies	250*l.* to 300*l.* &c.	June 18
*Sanitary Inspector	Plumstead B. of W.	3*l.*	June 21
*Instructor in Geometrical Drawings and Lecturer in Architecture	Royal Indian Engineering College	450*l.* &c.	No date

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. ***Contracts, pp.*** iv., vi., & viii. ***Public Appointments, p.*** xx.

BRITISH MINERAL PRODUCTION.—The "Mineral Statistics of the United Kingdom" for 1891 show that the total value of the minerals raised last year was 91,238,032*l.*, against 92,794,481*l.* in 1890, which is a decrease for 1891 of 1,556,449*l.*, or 1·46 per cent.; the decline extending to nearly all branches of mineral production. The principal item of output was coal, of which were obtained 185,479,126 tons, or 4,264,836 tons (2·34 per cent.) more than in 1890, when the production was only 181,614,288 tons. The value of the coal output declined by 854,181*l.*, or 1·14 per cent., the figures being 74,090,816*l.*, against 74,953,997*l.* in 1890. Of iron ore, 12,777,689 tons were raised, valued at 3,355,860*l.*, compared with 13,780,767 tons, valued at 3,926,445*l.* This shows a falling-off in 1891 of 1,003,078 tons, or over 7 per cent., in quantity, and of 570,585*l.*, or 17 per cent., in value. Of the output of stone, the value only is given, amounting to 8,693,743*l.*, against 8,708,691*l.* in 1890; decrease, 14,948*l.*, or 0·17 per cent. The quantity of clays (excepting ordinary clay) obtained in 1891 was 3,222,035 tons (value, 943,896*l.*), against 3,308,214 tons (value, 899,166*l.*) in 1890. Thus, although the quantity raised in 1891 decreased by 86,170 tons, or 2·6 per cent., compared with 1890, the value increased by 44,730*l.*, or nearly 5 per cent. The production of slates and slabs amounted to 415,029 tons, against 434,352 tons in 1890; the values were 987,000*l.* and 1,027,235*l.* respectively; the decline being 19,323 tons, or 4·4 per cent., in quantity, and 40,235*l.*, or 3·9 per cent., in value. Of gypsum, 151,708 tons (valued at 60,038*l.*), against 140,293 tons (valued at 57,991*l.*), were obtained; decrease, 11,415 tons, or 7·55 per cent., and 2,047*l.*, or 3·4 per cent., respectively.

"HYLONITE."—This material, some specimens of which have been forwarded to us by Mr. H. Brockmann, the London agent of MM. Schreiber & Co., is a preparation of wood pulp, to be used in place of plaster or stucco for decorations, or for wall covering. The special value claimed for it is that it is guaranteed to stand any amount of heat "without shrinking, bending, or losing its original shape." "Paper stucco" is another material of the same class claiming the same heat-resisting qualities. If this resistance to heat is realised under test no doubt this is a very useful material for lining buildings which are intended to be specially fire-resisting. As far as decorative effect is concerned, the examples of ornament appear to be very deficient in sharpness as compared with plaster or stucco. This difficulty may be met to some extent by designing specially for the material, as is often done for cast-iron. At all events, in a practical sense the material seems worth attention.

DEDICATION OF THE CATHEDRAL BELLS, NEWCASTLE.—On the 7th inst. the new peal of bells recently placed in the belfry of St. Nicholas's Cathedral, Newcastle, were formally dedicated. There are ten bells in the new peal, exclusive of the major or hour bell. Messrs. John Taylor & Co., of Loughborough, have had the casting of the bells and the re-casting of the major.

HOMES FOR SAILORS IN THE EAST-END, LONDON.—A new branch institute, in West India Dock-road, of the British and Foreign Sailors' Society, of which the Duke of York is patron, is to be known as the Albert Edward Sailors' Rest. The freehold of a disused public-house, called the "Jolly Sailor," with a messuage at the back, have been bought by the society, who appeal for contributions in aid of their work, both at home and abroad, which they began about seventy-five years ago, on board of H.M.S. *Speedy*. In 1856 the society's labours were greatly promoted by the late Prince Consort's active co-operation. On December 5, 1888, the Duke of Cambridge re-opened the institute in Mercers'-street, Shadwell. Of the Scandinavian Sailors' Home, by the East and West India Docks, we gave an account in our number of June 25, 1887. The Home in Well-street, Wellclose-square, stands, we believe, on the site of the Brunswick Theatre, which replaced the Royalty Theatre burnt in 1826.

CAPITAL AND LABOUR.

THE THREATENED STRIKE IN THE LONDON BUILDING TRADE.—As the outcome of the demands of the London bricklayers as to hours and rate of wages (published in the *Builder* for April 9, p. 296), the London Association of Master Builders, feeling the practical inconvenience that would arise if the men of the different trades had varying hours for commencing and leaving off work, at a conference held with the representatives of the bricklayers on May 25 announced that they could give no reply to the demands of the men until a conference could be held between the representatives of all the trades and of the employers, with a view of agreeing upon one code of working hours and rules. This conference has now been arranged, and will take place a few hours after these lines are published, the representatives of the masters having agreed to meet, at 2 o'clock on Friday, June 10, three delegates from each of the following trades, viz., bricklayers, masons, carpenters, plumbers, painters, plasterers, smiths (including fitters and bell-hangers), and labourers. In spite of some rather wild talk which has appeared in some of the newspapers, we trust that both sides will exhibit a conciliatory spirit, and that a strike may be averted.

THE STRIKE IN THE CARDIFF BUILDING TRADES.—According to the *Western Mail*, the carpenters and joiners of Cardiff who have been concerned in the strike in the building trade there have agreed to accept the 8½d. offered by the masters, and to eliminate their free labour clause. This action, however, does not affect the other trades, for from the first the carpenters and joiners have held aloof from the allied trades.

MEETINGS.

SATURDAY, JUNE 11.

Architectural Association.—Visit to new Music School, Harrow, Mr. E. S. Prior, architect; and to other School buildings and houses at Harrow. Meet at Harrow Church at 3 p.m.

Incorporated Association of Municipal and County Engineers.—Eastern Counties District Meeting at Peterborough.

Junior Engineering Society.—Visit to the Works of the Patent Victoria Stone Co., Stratford. 3 p.m.

St. Paul's Ecclesiological Society.—Visit to Chesham Bois and Chesham.

Edinburgh Architectural Association.—The Sketching Class to meet at Royston House, Carolina Park, Granton, to make measured drawings and sketches of the south front of the mansion. 3 p.m.

MONDAY, JUNE 13.

Royal Institute of British Architects. — Business Meeting—(1) To receive the Report of the Scrutineers on the Election of the Council, Standing Committees, &c. (2) To receive and consider the Report of By-law 9 (Election of Fellows) Special Committee. 8 p.m.

Society of Engineers.—7.30 p.m.

Clerks of Works' Association (*Carpenters' Hall*).—Monthly meeting. 8 p.m.

TUESDAY, JUNE 14.

Incorporated Gas Institute.—Twenty-ninth Annual Meeting. 11 a.m.

Society of Biblical Archæology.—8 p.m.

WEDNESDAY, JUNE 15.

Incorporated Gas Institute. — Twenty-ninth Annual Meeting (*continued*). In commemoration of William Murdoch and the centenary of gas lighting, a "Murdoch" lecture will be given by Professor Vivian B. Lewes on "A Century of Work on the Development of Light from Coal Gas." 10 a.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary Meeting. 8.30 p.m.

Royal Meteorological Society.—Two papers will be read. 7 p.m.

THURSDAY, JUNE 16.

Incorporated Gas Institute. — Twenty-ninth Annual Meeting (*continued*). 10 a.m.

Society of Antiquaries.—8.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

7,229.—SELF-ACTING HOOK: *G Cooper.*—This patent refers to an invention for retaining doors, gates, or for any other purpose where a self-acting hook is required, to fasten back and release when required. The inventor provides a circular plate with a barrel containing a buffer and spring. There is a slot in the sides of the barrel for the purpose of sliding screws, working a hook. There is also a screw below the slot for holding the hook in position. This part is fixed on the skirting or other position above the floor line. A plate with staple and releaser lets go the hook.

11,175.—FLAP VENTILATORS: *S. S. Robson.* — This specification refers to an improvement in flap ventilators, the object of which is to produce a noiseless flap distinct from those now in use. The inventor uses asbestos paper, which is, of course, uninflammable and noiseless. It is fixed to the ventilator in the same way as the ordinary flaps in use.

14,608.—WINDOW-SASHES: *J. Hanson.*—This refers to an invention intended to be applied to carriage windows and the like, to prevent rattling or noise. One edge of the window-frame is provided with a corrugated slip corresponding in pitch to another corrugated slip contained by a metal case, and let into the groove of the door stile. To this case are attached inclined springs, upon which the loose slips work in such a manner that when the window is raised the corrugated slip slides up the inclined spring, so taking the grip off the window and allowing it to be raised without friction. When the window is stopped, the loose slips drop down the inclined springs and block the window.

4,871.—PIPE CONNEXIONS: *T. Robinson.*—The object of this invention is to make a perfect air and liquid tight joint between the earthenware outlet-pipe of a water-closet basin, or other sanitary appliance, and the

leaden soil-pipe in connexion with the drains, and to enable such joint to be readily opened and closed. To the end of the outlet-pipe is attached a metal conical ring grooved inside, and provided with three screws and an internal lip for the end of the pipe to abut against. To the end of the leaden soil-pipe is soldered a partially conical metal ring provided with a flange. A flat ring, or collar, made in two halves, is passed over the outlet pipe and abuts against the base of the conical ring. By means of bolts the earthenware pipe and the soil-pipe are firmly united together.

5,746.—DISTEMPER: *A. T. Morse.*—This specification relates to what is claimed to be an improved distemper for interior house decoration and other work. The specification states that it is a non-poisonous self-binding distemper, complete in itself and ready for use by mixing merely with water without the addition of size or other ingredients. The chief ingredients are gilders' whiting, gelatine, oxide of zinc, and sulphate of manganese.

NEW APPLICATIONS FOR LETTERS PATENT.

May 23.—9,732, H. Martin, Tool for Forming a Recess in Bricks or other articles which can be moulded in clay or other similar substance.—9,755, R. Pancoast, Ventilators or Chimney-cowls.—9,761, W. Allen, Ventilating Buildings.—9,762, W. Allen, Window-frames.

May 24.—9,790, J. Shaw, Window-fastener.—9,826, E. Torrey, Plumbers' Waste-pipe Traps.—9,847, W. John, Facing Bricks or Tiles.—9,853, L. Lecellier, Automatically Released Latch or Bolt for Locks.

May 26.—9,908, G. Addy and W. Johnson, Self-releasing Safety Grindstone Rest.—9,924, W. Bosley, Self-fixing Expansion Block for Flushing Sewers.—9,950, J. McHardy and W. Garland, Wood-carving and Moulding Machines.—9,951, E. Ramsbottom, Window-fittings.—9,974, H. Majewski and W. Beyenbach, Artificial Marble.—9,980, C. Hill, Door-stops and Draught-excluders.—9,996, G. Gwillim and H. Swan, Tool or Apparatus for Carving Wood, Stone, or other material, or for boring or drilling holes in the same.—10,031, W. Gabriel, Hanging Windows.—10,038, B. Pitt, Open Firegrates.

May 27.—10,087, W. Slade, Catch for Sliding Doors or Sashes.—10,089, H. Dodd, Window Respirator and Draught-check.—10,111, J. Williams, Caps, Pots, or Tops for Chimneys, Ventilating-shafts, &c.—10,123, H. Doulton and S. Leech, Terra-cotta and like materials, and in apparatus therefore.—10,132, J. Riordan, Sash-fastener.

May 28.—10,160, J. Baines, Artificial Stone.—10,179, D. Paul, Firegrates and Register-grates.—10,224, G. Tweedy, Chimney-pots and Cowls.

PROVISIONAL SPECIFICATIONS ACCEPTED.

6,285, C. Gray, Door-fasteners.—7,016, J. McFarlane and W. Edgar, Incandescent Electric Lamps.—7,802, D. Richmond, Flushing Water-closets, Urinals, &c.—8,078, H. Leggott, Sitting-room Fire-ranges.—8,122, H. Jodicke, Channelling Bricks, Artificial Stones, &c.—8,203, E. Hole, Sash-fasteners.—8,327, H. Hunt, Fire-grates.—8,346, W. Hewitt and H. Suart, Brick-making Machinery.—8,403, S. Johnson, Attaching Door-knobs to Spindles.—9,052, G. Hall, Letter-boxes for use on private dwellings.—9,154, W. Teschauer, Sliding Windows.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

9,835, R. Tapscott, Self-closing Water-taps.—10,661, W. Pilkington, Kilns for Annealing Plate-glass.—12,444, R. Rosoman, Ventilators.—12,891, J. Harris, Syphon Flushing Cisterns.—4,408, C. Dobbs, Scoria or Slag Blocks for Paving, &c.—7,804, A. and A. Budde, Traps for Sewers or Drains.—7,850, E. Warner and J. Curry, Mortar.—7,907, W. Pryke and W. Palmer, Eaves Gutters.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MAY 30.—By *H. J. Bromley*: "Ada" and "Maude" Villas, Sydenham, u.t. 66 yrs., g.r. 11*l.*, r. 53*l.*, 250*l.*; 13 and 15, High-st., u.t. 13 yrs., g.r. 5*l.* 8s., 265*l.*; 85 to 97 odd, Ormside-st., Old Kent-rd., u.t. 61 yrs., g.r. 17*l.* 10s., 470*l.*—By *Weatherall & Green*: 75, Claybrook-rd, Fulham, u.t. 88 yrs., g.r. 5*l.* 5s., r. 28*l.* 12s., 180*l.*—By *Broad & Wiltshire*: "Clovelly," The Avenue, Grove-pk., with grounds, f., r. 210*l.*, 3,100*l.*; a plot of f. land, Bromley-rd., 430*l.*—By *Bean, Burnett, & Co.*: "Isleworth House," Isleworth, and 19 acres, f., 11,000*l.*; "The Black Boy" public-house, Mile-end-rd., f., r. 115*l.*, 2,050*l.*; 171 to 179, Mile-end-rd., f., r. 198*l.*, 2,930*l.*—By *Hampton & Sons*: "Rockville," Cosham, Hants, and 4½ acres, f., 3,800*l.*—By *Farebrother, Ellis, & Co.*: f.g.r. of 28*l.*, reversion in 59 yrs., Newington-green, 840*l.*; f.g.r. of 19*l.* 10s., Mildmay-grove South, ditto in 59 yrs., 492*l.*; f.g.r. of 10*l.*, Aden-ter., Hornsey, ditto in 53 yrs., 262*l.*; f.g.r. of 7*l.* 4s., Burma-rd., Green-lanes, ditto in 57 yrs., 195*l.*; f.g.r. of 30*l.*, "Triangle Cottages," Hackney, ditto in 68 yrs., 549*l.*; a plot of f. land, Shooter's Hill, 4a. 1r. 20p., 470*l.*; 9, Cosmo-pl., Southampton-row, f., r. 86*l.* 5s., 1,430*l.*; 13, Cosmo-pl., f., r. 87*l.*, 1,400*l.*; f.g.r of 104*l.* 10s., Queen-sq., Bloomsbury, reversion in about 800 yrs., 3,355*l.*—By *Reynolds & Eason*: F.g.r. of 173*l.* 5s., Blantyre-st., Chelsea, reversion in 420 yrs., 4,100; f.g.r. of 300*l.* 2s., Seaton-st., ditto in 420 yrs., 7,160*l.*; 61, 63, and 65, Seaton-st., f., r. 96*l.*, 1,330*l.*; freehold rental of 75*l.*, Cheyne-walk, u.t. 420 yrs., 1,640*l.*; 73, Oakley-street, u.t. 69 yrs., g.r. 2*l.*, r. 70*l.*, 850*l.*; 45, Oakley-sq., u.t. 73 yrs., g.r. 7*l.* 10s., r. 95*l.*, 1,600*l.*; 47, Oakley-st., u.t. 73 yrs., g.r. 7*l.* 10s., r. 75*l.*, 1,200*l.*

MAY 31.—By *Segrave & Taylor*: 5, 7, and 9, Farrer-st., Brixton, u.t. 28 yrs., g.r. 9*l.*, 277*l.* 10s.—By *R. A. Notley*: 3, Charlton-st., Fitzroy-sq., u.t. 23 yrs., g.r. 18*l.*, r. 80*l.*, 500*l.*—By *Kelf & Son*: 5 to 8, West-rd., Tottenham, u.t. 74 yrs., g.r. 22*l.*, 560*l.*; 47, Prospect-pl., Edmonton, u.t. 56 yrs., g.r. 5*l.* 5s., r. 19*l.*, 150*l.*—By *Messrs. Trollope*: the f. residence, "St. Helen's," Hampton Wick, 3,700*l.*—By *Messrs. Foster*: "Oakleigh," Thetford-rd., Malden, f., r. 45*l.*, 790*l.*; f.g.r. of 16*l.*, Villiers-rd., Willesden, with reversion in 94 yrs., 330*l.*; f.g.r. of 15*l.*, Brownlow-rd., ditto in 94 yrs., 295*l.*; a perpetual rent charge of 4*l.* 6s. 7½d., Blackburn, 87*l.* 10s.—By *Debenham, Tewson, & Co.*: 7, Blue Cross-st., Leicester-sq., f., r. 75*l.*, 1,070*l.*; f.g.r. 139*l.* 17s. 6d., Trigon-rd., Lambeth, reversion in 32 yrs., 4,750*l.*; f.g.r. of 51*l.* 9s., Granville-rd., Kilburn, ditto in 70 yrs., 1,180*l.*; f.g.r. of 151*l.* 4s., Netherwood-st., ditto in 75 yrs., 3,660*l.*; f.g.r. of 50*l.*, Charles-st., Stamford-hill, ditto in 81 yrs., 1,000*l.*—By *Ventom, Bull, & Cooper*: 230 and 232, Gray's-inn-rd., u.t. 18 yrs., g.r. 54*l.*, r. 140*l.*, 600*l.*; 46, 47, 49, 50, and 51, Myddleton-st., Clerkenwell, u.t. 19 yrs., g.r. 20*l.*, 1,000*l.*; 2 and 3, Garnault-pl., u.t. 19 yrs., g.r. 10*l.*, r. 75*l.*, 450*l.*; 5 to 8, Garnault-mews, u.t. 19 yrs., no g.r., 110*l.*; 14, Mabledon-pl, St. Pancras, u.t. 14 yrs., g.r. 21*l.*, r. 50*l.*, 110*l.*; 1 to 6, Southampton-buildings, Euston-sq., u.t. 15 yrs., g.r. 12*l.*, 460*l.*—By *J. G. Hammond, junr.*: 24, 26, and 28, South-pk.-hill-rd., Croydon, f., r. 140*l.*, 3,450*l.*; 25, 27, 33, and 35, Birdhurst-rd., f., r. 220*l.*, 3,125*l.*; the f. residence, "Homeleigh," Hayling-pk.-rd., r. 120*l.*, 1,600*l.*; "St. Sidwell's," Main-rd., f., r. 50*l.*, 900*l.*

JUNE 2.—By *P. Hodson*: 5 and 6, Ralph-st., Holloway, u.t. 76 yrs., g.r. 9*l.*, 240*l.*—By *Deverell & Co.*: 6, Raveley-rd., Kentish Town, u.t. 77 yrs., g.r. 3*l.*, r. 44*l.*, 500*l.*; 23A, Bickerton-rd., u.t. 84 yrs., g.r. 6*l.*, r. 40*l.*, 395*l.*; 57, Bartholomew-rd., Camden-rd., u.t. 66 yrs., no g.r., 775*l.*; 15, Fitzroy-rd., Regent's-pk., u.t. 70 yrs., g.r. 8*l.*, 540*l.*—By *Newbon & Co.*: "Bellevue House," Bellevue-rd., Southgate, f., r. 35*l.*, 520*l.*; 63, Judd-st., Euston-rd., u.t. 14 yrs., g.r. 18*l.* 18s., r. 65*l.*, 185*l.*—By *T. Wright*: 2, Surreyville-gardens, Barnes, u.t. 89 yrs., g.r. 10*l.*, r. 63*l.*, 680*l.*; 14, Studland-st., Hammersmith, u.t. 75 yrs., g.r. 5*l.*, r. 39*l.*, 290*l.*; 18, Acacia-rd., Sydenham, f., 365*l.*; 95, Goodrich-rd., Dulwich, u.t. 87 yrs., g.r. 6*l.*, r. 26*l.*, 165*l.*—By *Wilkinson, Son, & Welch* (at Brighton): "North House," Gloucester-pl., Brighton, f., 3,000*l.*

[Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER		
Greenheart, B.G. ton	9/0/0	0 0 0
Teak, E.I... load	9/10/0	15/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/0/0
Birch, do.	3/5/0	4/10/0
Elm, do.	3/10/0	4/15/0
Fir, Dantsic, &c.	1/10/0	3/10/0
Oak, do.	3/0/0	5/5/0
Canada.....	5/10/0	7/0/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/10/0	5/0/0
Lath, D'ntsic, fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland		
2nd & 1st std 100	8/0/0	9,10 0
Do, 4th & 3rd..	7/0/0	8/0/0
Do. Riga	7/0/0	8/0/0
St. Petersburg, 1st yellow ..	11/0/0	14/10/0
Do. 2nd yellow	8/0/0	10/0/0
Do. white	7/10/0	10/10/0
Swedish	7/10/0	15/10/0
White Sea	8/0/0	17/10/0
Canada, Pine 1st	20/0/0	26/0/0
Do. do. 2nd....	14/10/0	18/0/0
Do. do. 3rd, &c.	8/0/0	10/5/0
Do. Spruce. 1st	8/10/0	11/0/0
Do. do. 3rd & 2nd.....	6/15/0	8/0/0
New Brunswick	7/0/0	7/10/0
Battens, all kinds	3/10/0	15/10/0
Flooring Boards, sq., 1 in. prep. 1st	0/8/0	0/14/0
Do. 2nd.....	0/7/0	0/11/0
Other qualities	0/3 6	0/7/6
Cedar, Cuba ..ft.	/3½	/4½
Honduras, &c.	/3½	/4
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo av	/4½	2/0
Mexican do. do	/4	/5
Tobasco do. do	/5½	/7
Honduras do..	/5½	/8½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	18/0/0
Satin, St. Domingo ....ft.	0/0 8	0/1/3

TIMBER (*continued*).		
Satin, Porto Rico	0/0/8	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Pig, in Scotland .....ton	2/1/7	0/0/0
Bar, Welsh, in London.....	5/17/6	6/0/0
Do. do. at works in Wales	5/7/6	5/10/0
Do, Staffordshire, in London	6/5/0	6/15/0
COPPER—British, cake and ingot	48/10/0	50/0/0
Best selected ..	51/0/0	51/10/0
Sheets, strong..	58/0/0	59/0/0
Chili, bars	46/7/6	47/0/0
YELLOW METAL lb.	0/0/5½	0/0/5⅝
LEAD—Pig, Spanish....ton	10/15/0	10/16/3
English, com. brands	11/0/0	11/2/6
Sheet, English, 3 lbs. per sq. ft. and upwards ..	12/0/0	0/0/0
Pipe	12/10/0	0/0/0
ZINC—English sheet .....ton	25/15/0	26/0/0
Vieille Montagne.....	26/5/0	0/0/0
TIN—Straits	99/7/6	99/10/0
Australian	99/10/0	99/12/6
English Ingots	101/0/0	101/10/0
OILS.		
Linseed .....ton	18/0/0	18/2/6
Cocoanut, Cochin	24/0/0	0/0/0
Do. Ceylon	22/0/0	0 0/0
Palm, Lagos	22/5/0	22/10/0
Rapeseed, English pale	25/0/0	0/0/0
Do. brown	23/5/0	0/0/0
Cottonseed ref...	19/0/0	0/0/0
Oleine	21/10/0	22/10/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	6/0/0	12 10/0
TAR—Stockholm barrel	0/19/0	1/0/0
Archangel	0/12/6	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Thursdays.*]

BURWASH (Sussex).—For the erection of stabling, out-buildings, and greenhouse, for Mr. A. Jarvis. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C.:—

S. Lusted & Son	£558	T. Dray*	£448 5 0
S. Piper.....	520 0 0	* Accepted.	

CHILWORTH (Surrey).—For erecting bakehouse and stable, Chilworth, Surrey, for Mr. R. Cos. Messrs. Peak & Lunn, architects Guildford:—

H. Brown	£229 10 10	Parsons	£192 18 0
Etherington.....	202 18 0	Downes, Guildford* ..	180 0 0
Edwards	195 0 0	* Accepted.	

GATESHEAD.—For laying down and constructing sewerage works at Dunston, for the Local Board. Mr. John Dinsdale, surveyor, Whickham, Gateshead:—

Thos. Heaton	£317 1 10	John J. & J. Robson, 95, Osborn-road, Jesmond, New-castle*	£233 1 6
Geo. Edward Simpson.	297 14 3		
Gustavus Bailey.....	290 10 1		
W. Scott.....	281 7 8		
Nicholson & Elliott ..	269 10 0	William Adamson....	226 13 2
Noble & Waugh	254 3 6	* Accepted.	

GUILDFORD.—For extension of Walnut Tree Close Roadway, Guildford, for the Earl of Onslow. Messrs. Peak & Lunn, architects, Guildford:—

Cunliffe	£365	W. Smith & Sons	£291
Robt. Smith	305	G. A. Franks, Guildford* ..	282
* Accepted.			

GUILDFORD.—For alterations to 123, High-street, Guildford. Messrs. Peak & Lunn, architects, Guildford:—

May	£257 0 0	Billimore	£198 0 0
Strudwick.....	225 0 0	Higlett & Hammond	162 6 0
Johnson.....	209 0 0	[All of Guildford.]	

GUILDFORD.—For erecting new house, Edgeborough-road, Guildford, for Mr. M. Colebrook. Messrs. Peak & Lunn, architects, Guildford:—

Downes	£1,950 0 0	Brown Bros.....	£1,791 7 6
Mitchell Bros.	1,927 0 0	Kingerlee	1,790 0 0
S. Ellis	1,872 0 0	Bottrill & Son.....	1,748 0 0
R. Smith	1,849 0 0	W. Smith & Sons ..	1,685 0 0
May	1,810 0 0	R. Pink, Milford* ..	1,662 0 0
Higlett & Hammond	1 796 0 0	* Accepted.	

GUILDFORD.—For alterations at the Old Barracks, Guildford, for Mr. Geo. Trimmer. Messrs. Peak and Lunn, architects, Guildford:—

Higlett & Hammond	£526 0	Billimore	£463 0
Diamond & Sons	500 0	Ellis, Guildford*	449 0
Johnson	468 8	* Accepted.	

GUILDFORD.—For erecting dairy and stable buildings, Guildford, for Mr. Lymposs. Messrs. Peak & Lunn, architects, Guildford:—

Billimore	£976 0	R. Smith.....	£260 0
Johnson	273 15	Higlett & Hammond	258 0
Coker	260 0	Edwards, Shalford*	214 10
* Accepted.			

GUILDFORD.—For erecting a pair of cottages, Ludlow-road, Guildford, for Mr. McWharrie. Messrs. Peak & Lunn, architects, Guildford:—

Strudwick	£464	Elliott	£375
Higlett & Hammond.....	427	[All of Guildford.]	

KEARSNEY (Kent).—For alterations and additions to house, for the Rev. J. W. Ewing. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C.:—

W. T. Adcock	£196	T. J. Chamberlain.....	£180

LEATHERHEAD.—For erecting house and shop at Leatherhead, for Mr. John Symonds. Mr. F. Dibble, architect:—

Edser.....	£1,637 0	Lee.....	£1,549 10
Hamblin Bros.	1,630 0	Brown Bros.	1,473 0
Colls & Son	1,624 0	W. H. Batchelar	1,402 10

LONDON.—For works in connexion with the Distillery-lane sewer, Fulham, for the Vestry of the Parish of Fulham. Mr. J. P. Norrington, Surveyor:—

Tomes & Wimpey.....	£387 0	J. Mears*.....	£315 0
R. Mullett	327 0	S. Saunders.....	232 10
G. Parry	325 0	* Accepted.	

LONDON.—For wood-paving, Harwood-road, Fulham, for the Vestry of the Parish of Fulham. Mr. J. P. Norrington, Surveyor:—

	Creosoted.	Plain Deal.
J. Biggs.....	£4,150 0	£3,800 0 0
Turner & Co.	4,090 0	3,790 0 0
Improved Wood-Paving Co.	4,013 0	3,824 0 0
E. Parry	3,880 0	3,560 0 0
Feli & Co.	3,518 11	3,288 16 6

LONDON.—For boundary wall, for the Vestry of the Parish of Fulham. Mr. J. P. Norrington, Surveyor:—

Keefe	£279 12 6	Parry	£259 0 0

LONDON.—For alterations at "The Crown" public-house, 179, Pancras-road, N.W., for Mr. B. F. Forster. Mr. W. Seckham Witherington, architect, 79, Mark-lane, E.C.:—

Larke & Sons	£664	Courtney & Fairbairn	£541
Spencer & Sons.....	597	Rowe Bros.	500

LONDON.—For the erection of new factories and offices at Messrs. Grindley & Co.'s tar and resin distillery, Poplar, E. Mr H. Percy Monckton, architect, 32, Walbrook, E.C.:—

W. B. Briant	£1,384 10	Harris & Wardrop* ..	£1,183 0
Harrison & Spooner....	1,189 0	* Accepted.	

Ironwork.

Croggon & Co.....	£506 10 6	F. Braby & Co.*	£469 10 0
Gospel Oak Co.	494 0 0	* Accepted.	

LONDON.—For the erection of a new police-station at Plumstead, for the Receiver for the Metropolitan Police District. Mr. John Butler, Architect, New Scotland-yard. Quantities by Mr. W. H. Thurgood:—

Hart Bros.	£4,825 0	Higgs & Hill	£4,394 0
Nightingale.....	4,795 0	Garlick & Horton	4,253 0
Holloway	4,696 0	Scrivener & Co.....	4,237 0
Perry & Co.....	4,695 0	Grover & Son.....	4,200 0
Gardener	4,597 18	Chappell	4,170 0
Ansell	4,500 0	Lathey Bros.....	4,120 0
Willmott & Son.....	4,440 0		

LONDON.—For new drainage at Christchurch Workhouse, for the Guardians of the St. Saviour's Union, Surrey. Messrs. Jarvis & Son, architects:—

Charles Blyton	£1,472 0 0	Irwin Wallas	£921 0 0
Tom Turner, Limtd.	1,138 0 0	Johnson & Co.....	873 0 0
F. C. Stokes & Co.. ..	1,105 0 0	Pettitt & Axtell.....	859 0 0
George Newton	997 0 0	Joseph Cowper*.....	722 0 0
Matthew Brodie	968 7 8	* Accepted.	

LONDON.—For rebuilding No. 51, Cheapside, for the Aërated Bread Company, Limited. Mr. Geo. Edwards, architect, 52, Cannon-street:—

J. Knight	£2,670	Leslie & Co.	£2,243
C. Wall	2,635	Ward & Lamble	2,221
Martin Wells & Co.	2,499	T. Stevens	2,178
O. Craske	2,359	Stimpson & Co.	2,173
Colls & Son	2,270	Scharien & Co. (accepted).	2,118

LONDON.—For erecting and completing new warehouse and stables situate at Storehouse Wharf, Ratcliffe, E. Mr. Chas. Dunch, architect. Quantities by Mr. J. F. Wesley, 294, Romford-road, Forest-gate:—

J. Greenwood	£5,098	Stimpson & Co.	£4,854
J. Morter	5,067	Brown, Son, & Bloomfield.	4 820
B. E. Nightingale	4,985	Ashby & Horner	4,702
Harris & Wardrop	4,958	Munday & Sons	4,552
Lawrance & Son	4,936	Perry & Co.	4,529
Ashby Bros.	4,918	Scharien & Co. (accepted)..	4,483

LONDON.—For the erection of proposed Rectory House, St. Olave's, Old Jewry. Mr. Ewan Christian, architect. Quantities by Mr. J. O. Abbott:—

Dove Bros.	£4,395	Ashby & Horner.....	4,160
Holloway Bros.	4,352	Holland & Hannen	3,990
Charteris	4,330	B. E. Nightingale	3,893
Cornish & Gaymer.....	4,272		

LONDON.—For the erection of proposed Albert Palace Mansions for Mr. J. Halley. Mr. W. J. Chambers, architect:—

Martin Wells & Co. £12,550		Holloway Bros.....	10,914
Higgs & Hill	11,640	Oldeney & Sons	10,900
Garlick & Horton.....	11,464	Chappell	10,377
H. & R. Lee	11,218	Turtle & Appleton	10,364
Prestige & Co.	11,060	B. E. Nightingale.....	10,21
Kirk & Randall.....	11,044		

LONDON.—For several works in building new church-house, and restoration to the Church of St. Mary, Clapham. Mr. J. Francis Bentley, architect. Quantities by Mr. A. G. Gate:—

Colls & Sons	£20,594	Higgs & Hill	£19,890
Lawrence.....	20,280	Nightingale.....	19,300

LONDON.—For rebuilding No. 16, Newman-street, Oxford-street, W., for Dr. Kirby. Messrs. F. W. Porter & Hill, architects:—

Staines & Sons	£5,589	Allen & Sons	£4,920
Perkins	5,430	B. E. Nightingale	4,863
Woodward & Co.	5,420	Worsley.....	4,813
T. Rider & Son.....	5,340	W. Downs.....	4,800
A. & H. Bywaters	5 220	J. Morter	4,784
D. Charteris	5,185		

LONDON.—For superstructure and finishings in Great Trinity-lane, E.C., for Mr. W. H. Gray. Mr. H. Cowell Boyes, architect:—

Brown, Son, & Blomfield..	£8,379	Colls & Sons	£7,691
J. Smith & Son	8,147	Grover & Son	7,680
B. E. Nightingale	8,122	Cubitt	7,620
Kilby & Gayford.....	7,934	Ashby & Horner.....	7,515
T. Boyce.....	7,890	Patman & Fotheringham..	7,363
M. Patrick & Son	7,727	Gould & Brand.....	7,258

LONDON.—For re-instating, after fire, Brandram's Wharf, Rotherhithe, S.E., for the Liverpool, London, and Globe Insurance Company:—

Hunt	£5,465	Lee	£4,783
Marsland	5,165	Smith & Son	4,638
Clarke & Bracey	4,953	Nightingale	4,550

LONDON.—For proposed new drill hall, offices, &c., Clapham, at for Lieutenant-Colonel A. J. Bowen, Commanding. Mr. R. A. Briggs, architect:—

Harrison & Spooner	£6,332	Turtle & Appleton	£5,872
Balaam Bros.	6,052	Kirk and Randall	5,791
H. L. Holloway	5,986	Nightingale	5,770
Holloway Bros.	5,886		

LONDON.—For iron escape-staircase at the Workhouse, Old Gravel-lane, E., for the Guardians of the parish of St. George-in-the-East. Messrs. Wilson, Son, & Aldwinckle, architects, 1, Victoria-street, Westminster, S.W.:—

T. & W. Cole	£654 0 0	The St. Pancras Iron Work Company*	£510 0 0
The Lion Foundry Company	620 17 6		
T. Potter & Sons, Ltd.	518 0 0		

* Accepted.

MAIDENHEAD.—For erecting St. Mary's new R.C. Schools, for the Rev. John Watson. Mr. Fredk. A. Walters, architect, 4, Great Queen-street, S.W. Quantities by Mr. John B. Lofting, 4, Great Queen-street, S.W.:—

Longley & Co.	£2,075	Cooper & Sons	£1,972
Gregory & Co.	2,014	Bottrill & Son, Reading*	1,767
Silver & Sons	1,998		

* Accepted.

PLASHET.—For painting and repairs at the Industrial Schools, Plashet, for the Guardians of the parish of St. George-in-the-East. Messrs. Wilson, Son, & Aldwinckle, architects, 1, Victoria-street, Westminster, S.W.:—

G. E. Todd	£638	T. White & Son*	£473
J. Holland	593		

* Accepted.

RIPLEY (Surrey).—For additions to business premises, Ripley, Surrey, for Mr. Richard Green. Messrs. Peak & Lunn, architects, Guildford:—

Whitbourn	£468 0 0	Johnson	£387 9 0
Pullen	440 0 0	Billimore	384 0 0
Young	410 0 0	Higlett & Hammond,* Guildford	355 0 0
Brown	424 0 0		

* Accepted.

SWANSEA.—For the erection of two shops and premises, Alexandra-road, Swansea, for Mr. Jacob Jenkins. Mr. H. C. Portsmouth, architect, Swansea. Quantities by the architect:—

David Jenkins	£1,795 0 0	Thos. Watkins & Co.	£1,690 0 0
Bennett Bros.	1,785 0 0	Lloyd Bros.	1,500 0 0
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[All of Swansea.]

WALTHAMSTOW (Essex).—For the erection of a new police station at Walthamstow, for the Receiver for the Metropolitan Police District. Mr. John Butler, Architect. Quantities by Mr. W. H. Thurgood:—

Gardener	£5,005	Chappell	£4,687
Hart Bros.	4,094	Grover & Son	4,643
Higgs & Hill	4,980	Scrivener & Co.	4,627
Holloway	4,770	Lathey Bros.	4,500
Wilmott & Sons	4,750	Morter	4,457
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WIMBORNE.—For alterations and additions to stabling, &c., at Canford Manor, Wimborne, Dorsetshire, for the Right Honourable Lord Wimborne. Messrs. Romaine-Walker & Tanner, architects:—

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The Board of Works for the Plumstead District have fixed WEDNESDAY, the 29th day of JUNE, 1892, for the appointment (at their Meeting to be held at this Office at HALF-PAST SIX p.m. on that date), of a fit and proper person as SANITARY INSPECTOR for the Parish of Lee and liberty of Kidbrook, within the said District.

The salary proposed to be assigned to such Inspector is 3l. per week. Age between 25 and 45.

The appointment will be subject to the approval of the Local Government Board, and may be determined upon one month's notice on either side. The Inspector will be required to discharge all the duties of a Sanitary Inspector under "The Public Health (London) Act, 1891," and "The Sanitary Officers' (London) Order, 1891," made by the Local Government Board; and the Inspector will also have to discharge all duties of a Sanitary Inspector under all other Acts relating to the management, health, and government of the Metropolis. No compensation will be paid on abolition of office.

Applications, stating age, qualifications, and experience, must be made in candidates' own handwriting by letter, sent by post or delivered, and addressed "The Committee Clerk, Parochial Offices, Woodstock-road, Lee, London," not later than TWELVE o'clock at NOON on TUESDAY, the 21st JUNE, 1892. Copies only of not more than three recent testimonials may be sent at the same time. Canvassing prohibited.

By Order
GEORGE WHALE,
Clerk.

Central Office,
Old Charlton, London,
May 31st, 1892.

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Town Hall,
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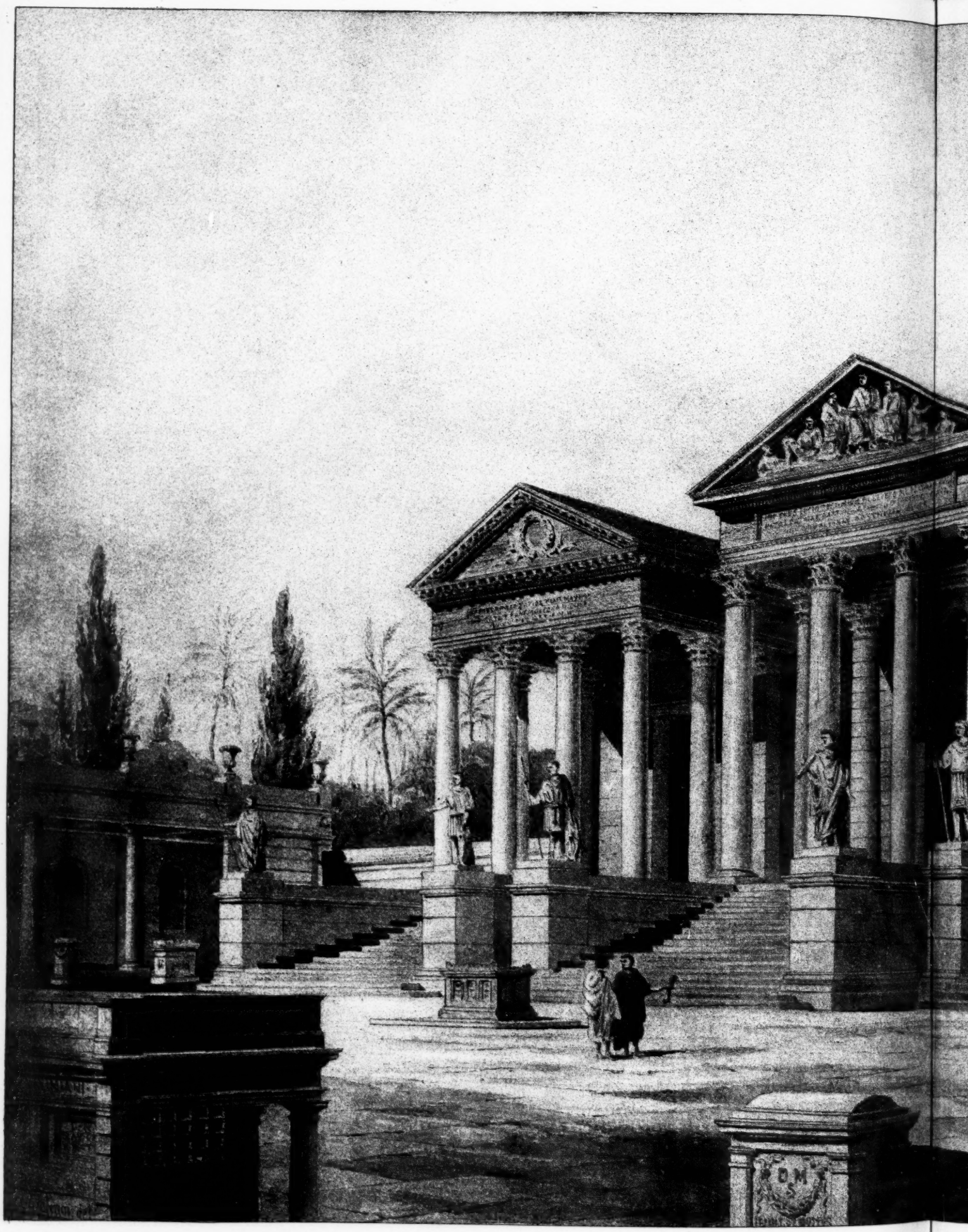
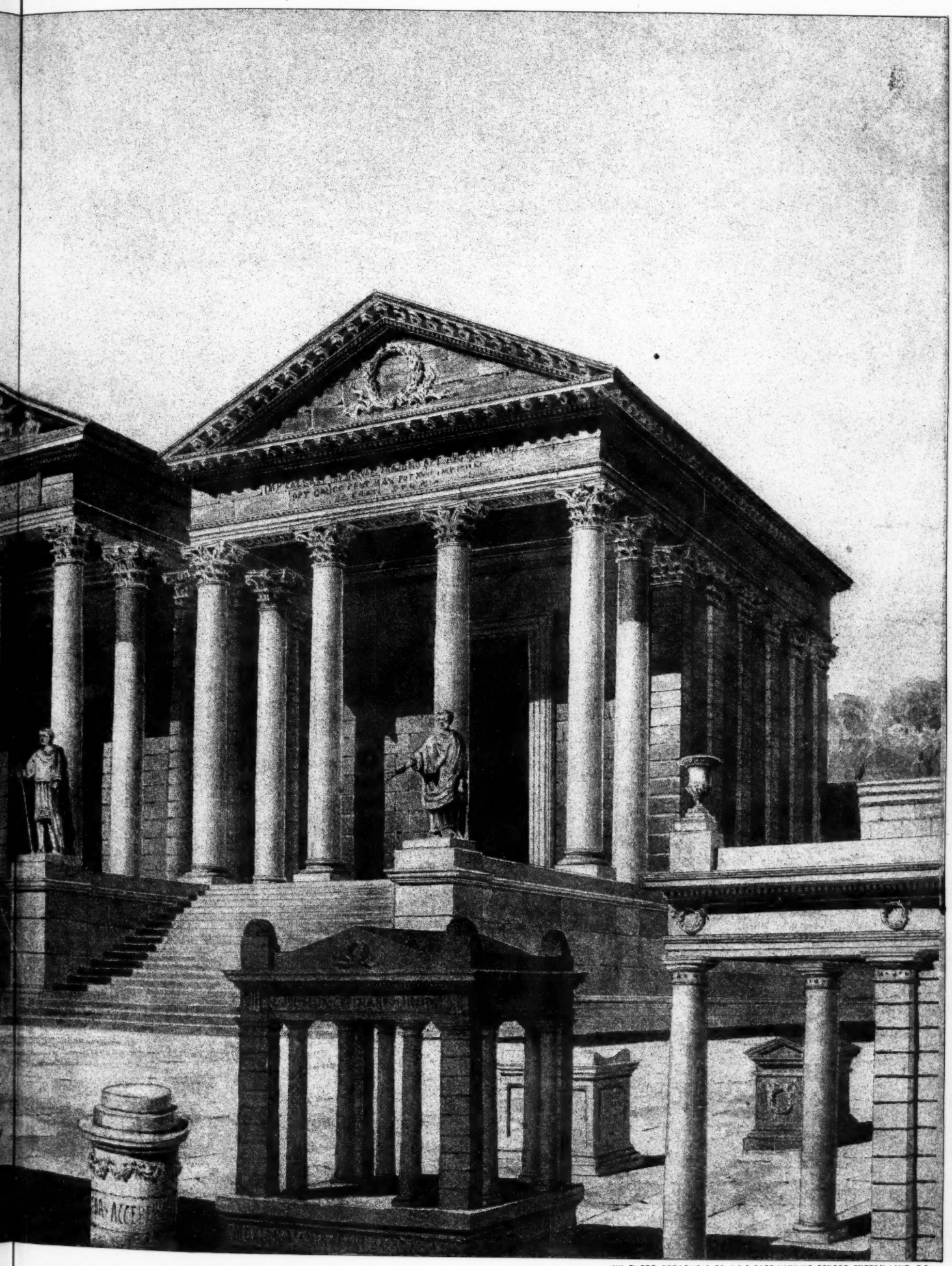


THE THREE TEMPLES AT SBEITLA, NORTH AFRICA.—Re



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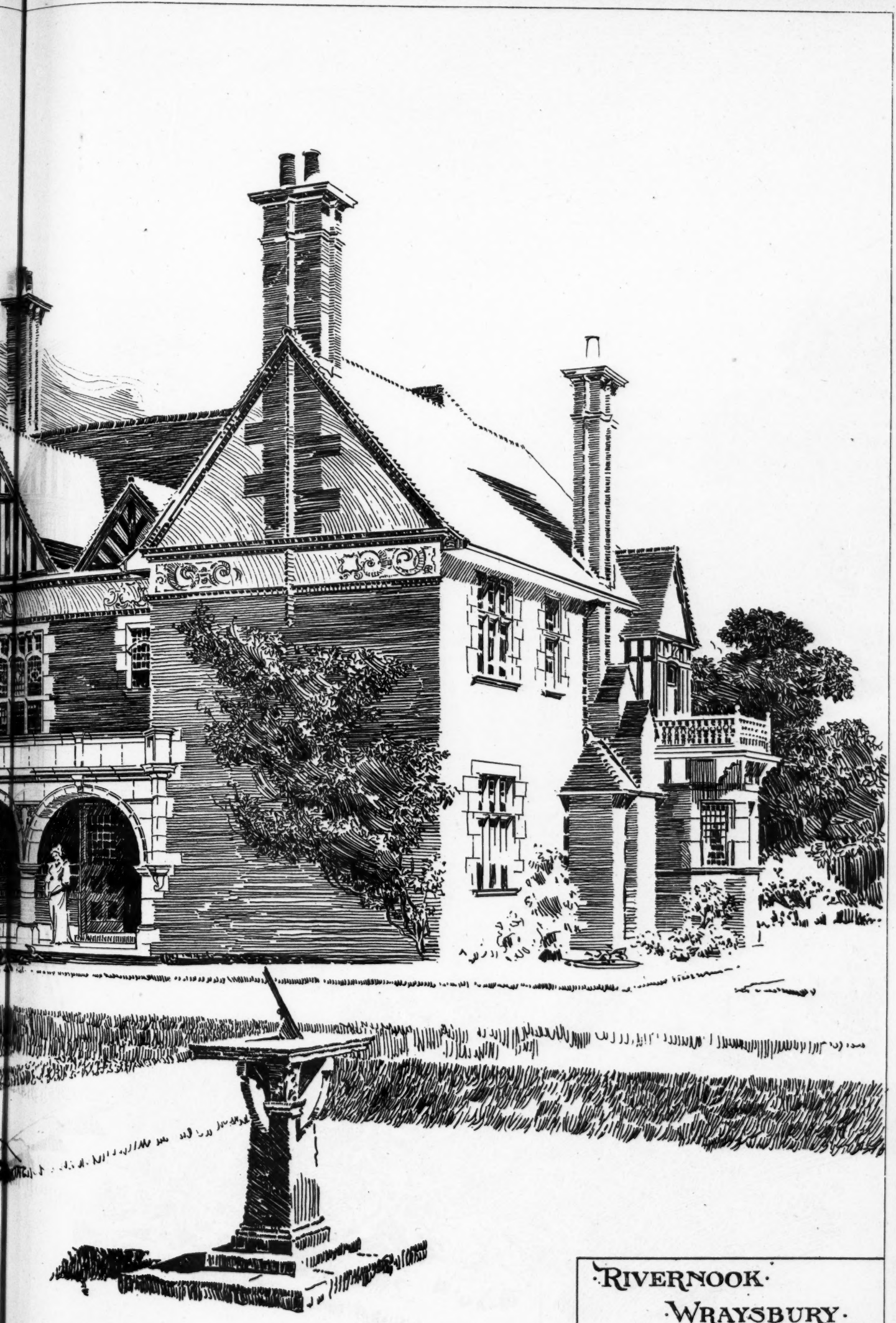

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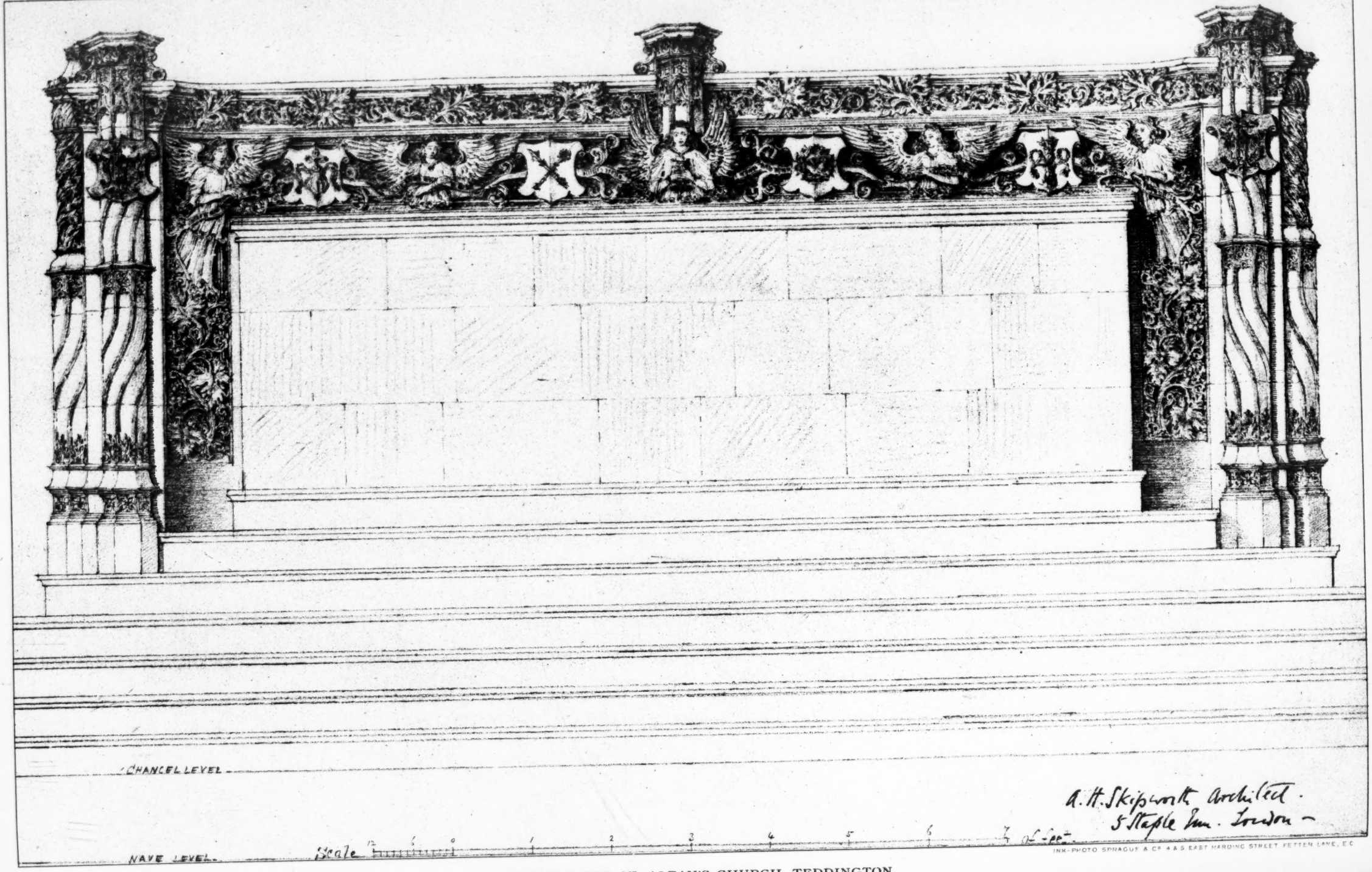
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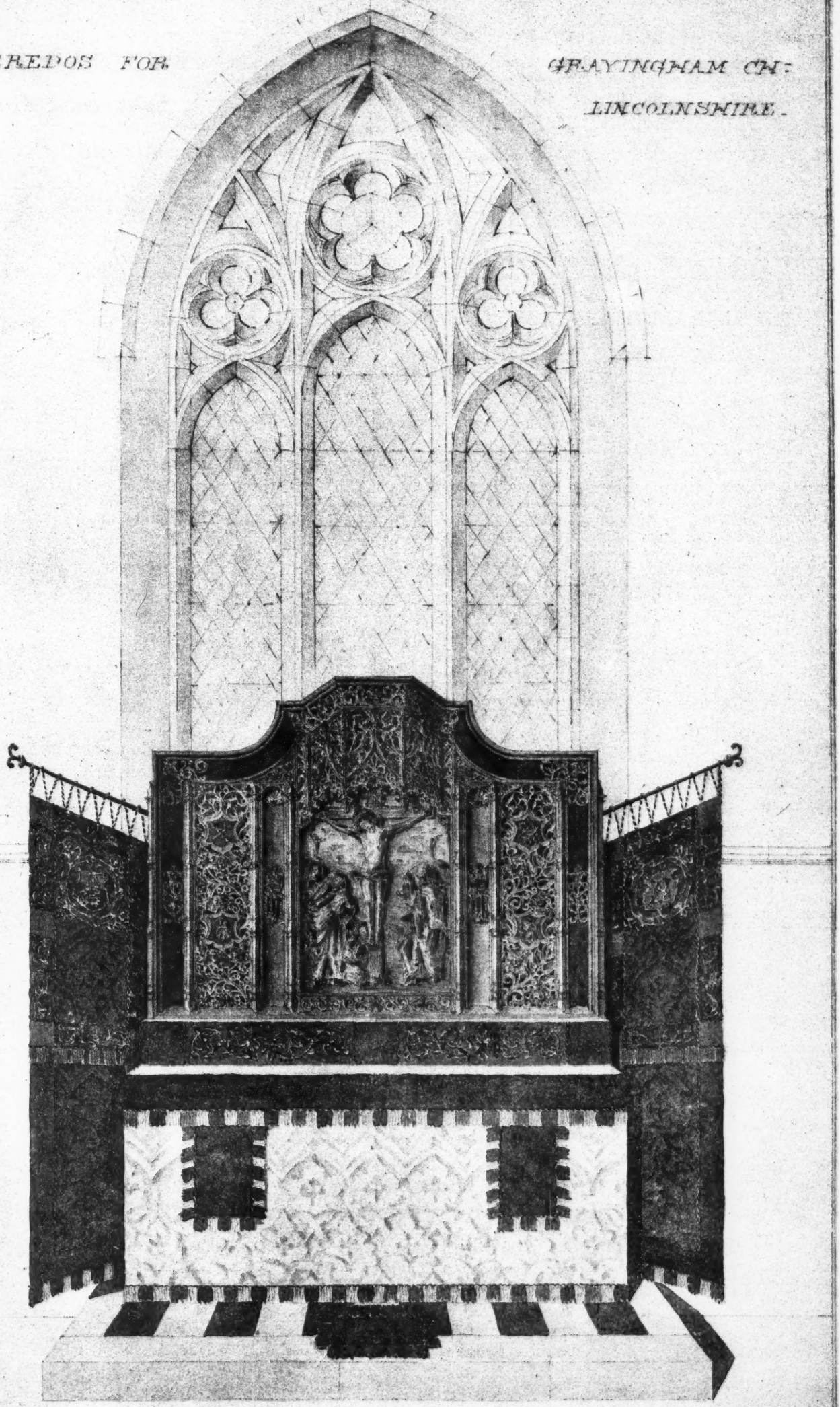

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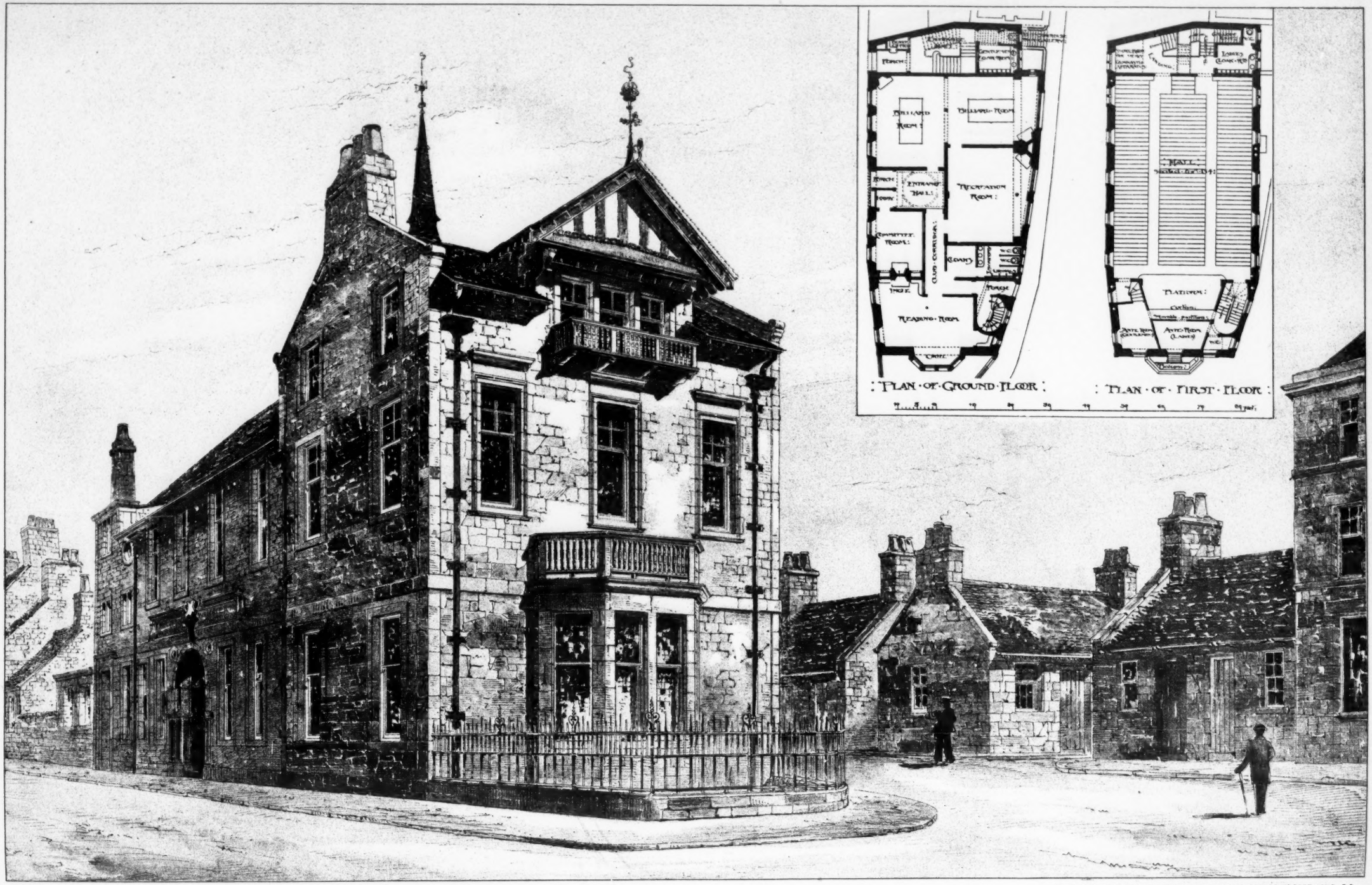

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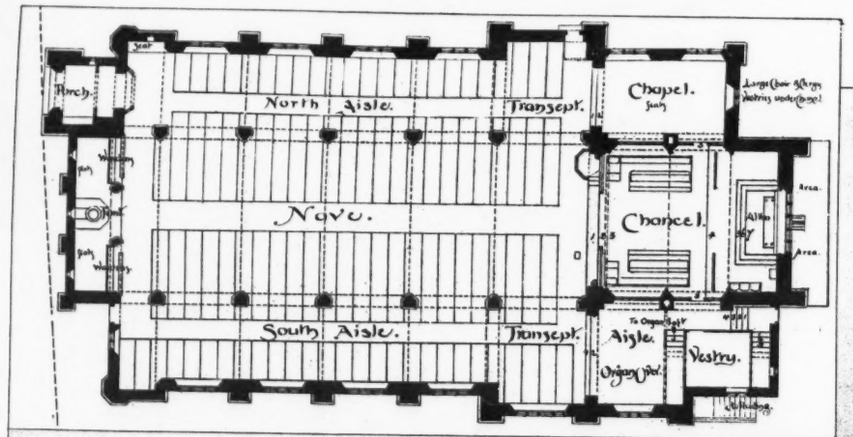

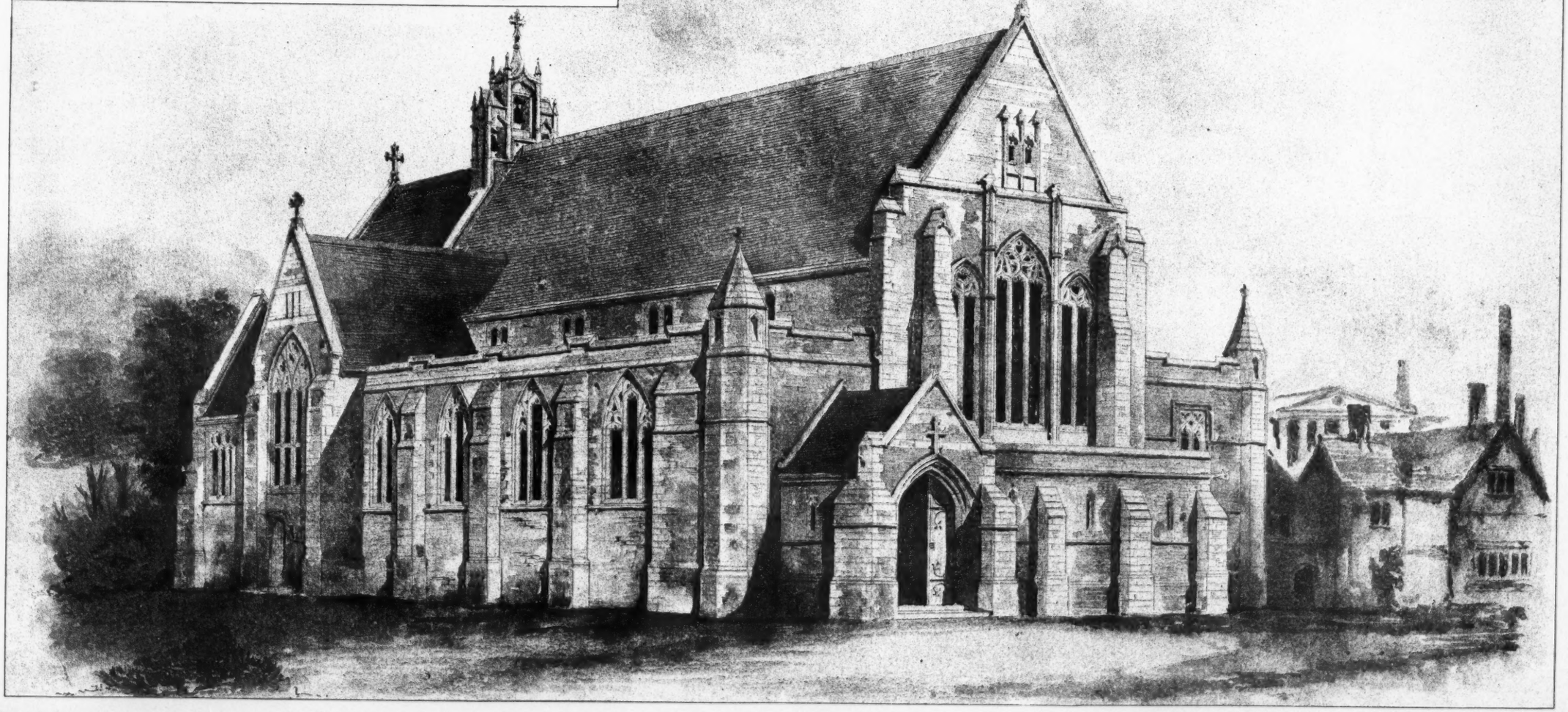

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